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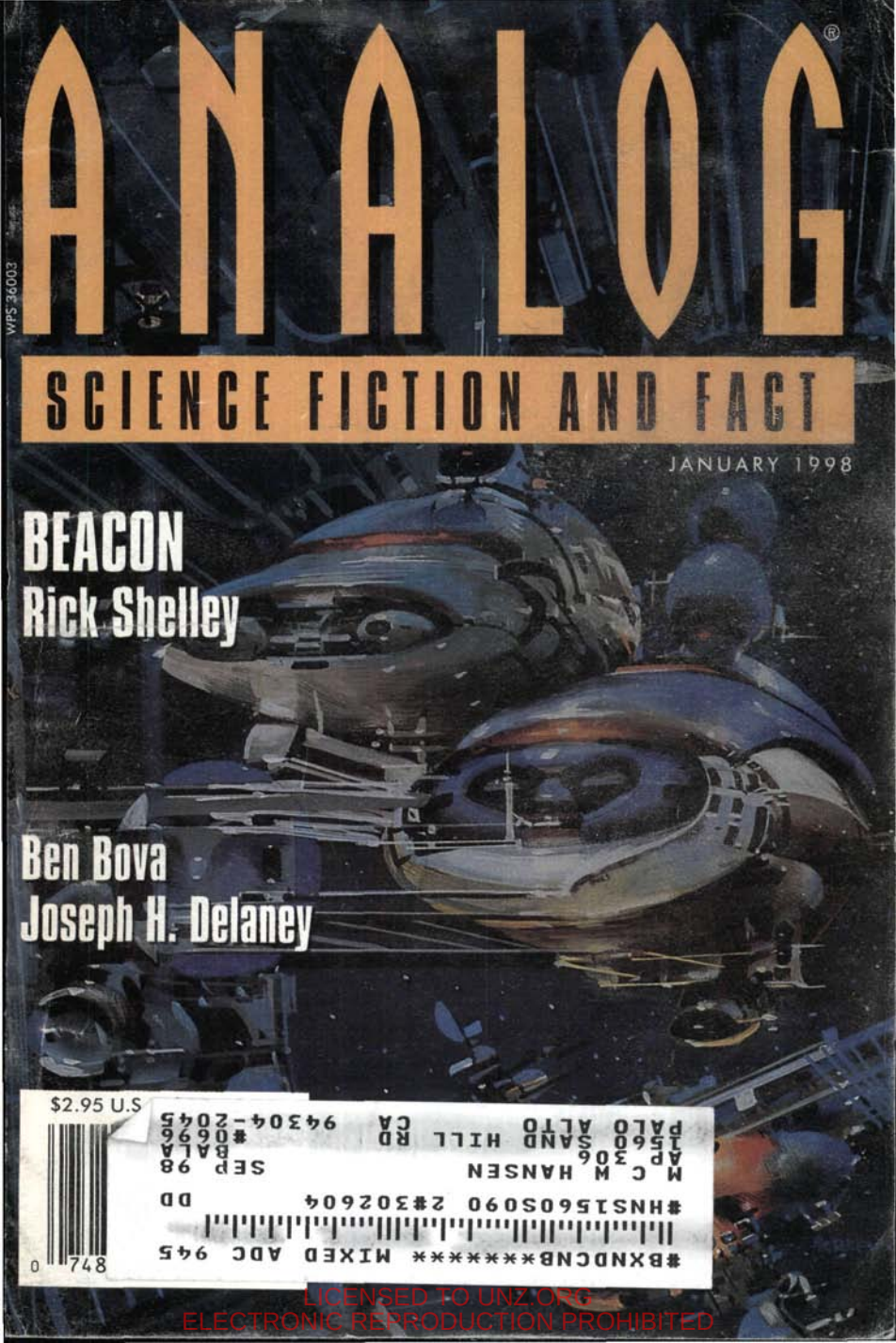

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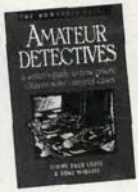

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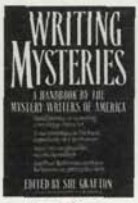

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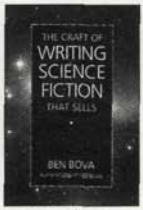

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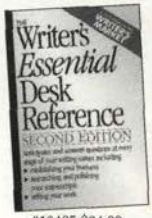

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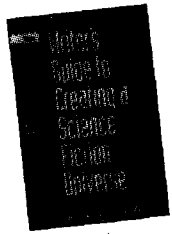

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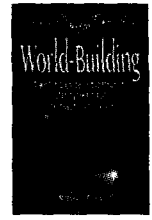

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EDITORIAL Stanley Schmidt

NATURAL SUCCESSION

A wise man once observed that companies, like ecosystems, go through fairly predictable stages of development. Lately I've been pondering the disturbing possibility that entire cultures—ours, for instance—might follow much the same pattern as companies.

A forest starting over after a fire initially has only certain kinds of small plants, which are in turn replaced by a sequence of mixtures of other types. The earliest to thrive will be types that like lots of sunshine, because there is no shade. As some of those become large trees, small understory plants that like sunshine necessarily give way to those that need shade.

Companies, according to the aforementioned observer (who has had many years of industrial experience), are typically started, and initially run, by technical or "idea" types. Later they come under the supervision of professional managers, and eventually the operation is largely run by its accountants. Each phase tends to bring with it certain characteristics of *how* the business is run.

There are exceptions, of course, but the pattern does seem to have a good deal of validity. The technical/idea phase might be exemplified by the birth of the Apple computer company, started by people with lots of hands-on experience building and using computers, who had an idea for a new kind of computer that would appeal to people put off by the old kind. Or by some of the early publishers of science fiction, who got into the business because they personally loved (and sometimes wrote) the stuff and wanted to get more of what they liked into print, and make a living in the process.

It may be inevitable that companies run by such people eventually turn over much of their management to professional managers: people whose main interest and training is management *per se* and for whom the product they're selling is incidental. Those who are driven by a passion for research or art may find the business aspects of running a company an annoying chore, and may not be very good at it. As a small company started by individuals with a Really Good Idea becomes a big company trying to meet a large demand, the Really Good Idea folks may find that they need help in dealing with problems like optimizing manufacturing processes and marketing strategies.

So they bring in MBAs, folks who

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have specialized in just that sort of thing. The potential problem with that is that professional managers may view managing as an end in itself. It's their job, and although they may try to do it conscientiously, they may have no particular interest in the particular product whose manufacture and marketing they're directing. They may not even *know* anything about the product, and may even sneer at the very suggestion that they should. I have actually heard some managers say, and claim that they were taught in business administration school, that a good manager can manage anything, and doesn't need to know anything about the product his or her current employer is selling.

I have long found this attitude disturbing. It seemed obvious to me that you can't make rational decisions about how to make or sell something if you don't know what it does or how it does it, how it's made or the potentials and limitations of the manufacturing methods, or what kind of people buy it and what they want to do with it. I was recently persuaded to make a *small* adjustment in my views, by a man who I believe *could* manage a good many processes without understanding their details. The key to doing so is to recognize and admit what you don't understand, and *listen* to your employees who do.

However, too often it doesn't work that way. Pride may make it difficult for a manager to admit that someone lower in the organization chart knows something important that he or she doesn't. And a manager in that position is at the mercy of his employees: He must take their word for what they tell him, since he is not qualified to judge for himself whether it makes sense or how it might be improved. It works fine *if* the employees are competent, conscientious, and trustworthy, but can cause big trouble if they're not.

So, while a skilled manager can *sometimes* effectively supervise a process he doesn't know much about, there's no real substitute for understanding at the hands-on level. Without that, even a conscientious manager may not realize until too late that he's being undone by employees who don't really know or care what they're doing. Or he may alienate employees who do, by treating them as if they don't because he can't tell the difference. Perhaps worst of all, he may become unduly reluctant to take a chance on new ideas from the Really

Analog Science Fiction and Fact (Astounding) is published monthly except for a combined July/August double issue by Dell Magazines, a division of Crosstown Publications. One-year subscription for $33.97 in the U.S.A. and possessions, in all other countries, $41.97 (GST included in Canada, GST # 123054108) payable in advance in U.S. funds. First copy of new subscription will be mailed within eight weeks of receipt of order. When reporting change of address allow 6 to 8 weeks and give new address as well as the old address as it appears on the last label. Periodical postage paid at New York, NY, and at additional mailing offices. Canadian postage paid at Windsor, Ontario. Canada Post International Publications Mail, Product Sales Agreement No. 260622. © 1996 by Dell Magazines, a division of Crosstown Publications, all rights reserved. Protection secured under the Universal Copyright Convention. Reproduction or use of editorial or pictorial content in any manner without express permission is prohibited. All stories in this magazine are fiction. No actual persons are designated by name or character. Any similarity is coincidental. All submissions must be accompanied by stamped self-addressed envelope, the publisher assumes no responsibility for unsolicited manuscripts or artwork. USPS 488-910, ISSN 1059-2113

POSTMASTER: Send change of address to: ANALOG SCIENCE FICTION AND FACT
P.O. Box 54625, Boulder, CO 80328-4625.
IN CANADA RETURN TO: 3255 WYANDOTTE STREET EAST, WINDSOR, ONT. CANADA N8Y 1E9
Editorial and Advertising: Analog Science Fiction and Fact, 1270 Avenue of the Americas, New York, NY 10020
Subscriptions: Analog Science Fiction and Fact, P.O. Box 54625, Boulder, CO 80322-4625

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Good Idea people. (Remember them?)

In its more extreme forms, this leads naturally into the third stage, where the accountants are effectively making most of the business decisions. Managers who can't personally judge whether a product will appeal to its intended market, or whether a proposed manufacturing process is feasible or efficient, may make more and more of their business decisions on the basis of what their accountants tell them. What the accountants tell them is important, of course; any company that wants to stay in business must keep a close eye on what it spends, what it gets for that, and what it can expect to make in the future.

But while accountants can provide highly specific, hard data on the first two points—direct costs and benefits—they are far less able to forecast future revenues. So the manager who wants to keep his job may make his decisions more and more on the basis of the easy data and try to avoid guesswork about the hard. This may be prudent in the short term and disastrous in the long. Companies that Make It Big are likely to do so by taking a chance on something new, and companies that look only at immediate costs and direct benefits become less and less likely to do that. Eventually they may be left behind and competed into the ground by those more willing to take a chance.

In extreme cases, they may even seriously undermine their own ability to keep doing what they already do well. I am reminded of a story I was once told, and assured was true, by a source I consider reliable. A company whose main product was jet engines was taken over by another, apparently well into the "government-by-ac-

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First issue of Astounding January 1930 ©

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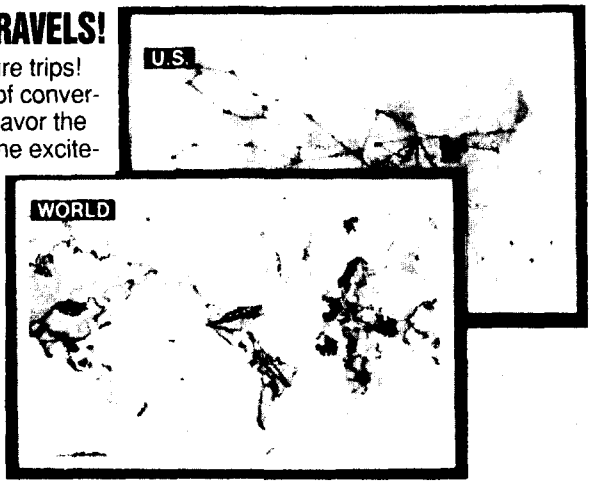

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countants" phase, whose prior experience was in supermarkets. The new owners promptly did a profitability study of their new acquisition by dividing the profit attributed to each department by the floor space it occupied. On that basis, they abolished their two "least profitable" departments: metallurgy and fluid dynamics, the very foundations of jet engine manufacture!

What does all this have to do with whole nations or cultures? Well, I think there's evidence of similar patterns—and perhaps similar lessons to be learned—on at least two levels: formal government, and general trends in How Things Are Done.

The United States of America, for example, started (in the sense that it can be considered to have started with the Revolutionary War and the few years thereafter) with a bunch of idea people. Sure, their original motivation was political; they were fed up with the old boss and ready to strike out on their own. But they had what were then some pretty radical ideas about how to do it better, and managed to drum up considerable enthusiasm among the customers for those ideas.

As time went on, people thought less and less about the ideas. The country became increasingly wrapped up in the day-to-day problems of running itself, and that running was increasingly done by career politicians. Sure, some of them did remember the ideas and ideals, and did what they could to implement them. But more and more, the business of politics was politics, and more of most politicians' effort went into getting reelected than into doing what would be best for the country. This, pretty clearly, is the "professional manager" phase.

Are we now into the "accountant" phase? This seems to me less clear, at least in the governmental arena. Anyone who's looked at the national debt and many government spending policies might at least question whether the government is being run by *good* accountants. But at the general cultural level, I've been seeing a wide range of areas in which accountants seem to be the dominant force in making decidedly non-bookkeeping decisions.

A few examples:

•Just today I heard a radio interview with a highly regarded concert pianist, comparing current and former practices in music recording and distribution. In his earlier years as a recording artist, he said, the first priority was to make the best possible recording of the best possible performance. If a session wasn't going well, producers and performers would take a break and come back to try again later. Now the emphasis is to get the recording done and out, with musical quality a secondary consideration. Whether a particular recording is made at all is likely to be decided beforehand not by musicians, but by a marketing committee.

•Most radio and television stations decide what to do largely on the basis of how much money they expect to be able to make. New York City has a big enough population to support commercial stations with almost any kind of programming, but what they do is dictated largely by their sponsors' concern for the bottom line. Thus

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we have such spectacles as a station which had for years given a convincing appearance of actually caring about high-quality classical music programming, changing literally overnight and with no warning to the hardest of hard-rock formats. At least one other station has switched most of its programming to short pieces and excerpts from big ones. Full-length symphonies and concerti, performed in their entirety, have become a rarity because advertisers have convinced programmers that most listeners have short attention spans (which may or may not be true) and the few who don't, don't matter.

•I have complained on several previous occasions, as have many other people, about the fact that important medical decisions are increasingly made not by doctors, but by insurance company clerks. A good snapshot of the currently prevalent attitude toward medicine, I think, can be found in the ads for one HMO that brags about its "commitment to involving doctors in the decision-making process for their patients' care," as if this were a remarkably magnanimous act on their part. To some of us it still seems self-evident that doctors should be the *primary* decision-makers, but our culture is being rapidly brainwashed into believing otherwise.

•When many science fiction book publishers were personally interested in the field at the literary level, there were two phenomena that have become largely extinct. The "midlist" included most books; they didn't become bestsellers, and nobody expected them to, but they did include a wide range of books appealing to a wide range of tastes. And they did make money, if slowly, as part of the "backlist," books printed some time ago but kept available and largely sold by mail order from ads in the backs of other books. Both midlist and backlist have largely vanished in recent times—partly because of the "Thor Power Tool" court decision, which turned what used to be a tax advantage into a tax liability; but partly, I and many other people think*, because of a widespread shift in publishers' priorities.

In recent times, thanks largely to certain movies and television series, publishers have discovered that some things labeled "science fiction" can make lots of money. They have put more and more of their efforts and resources into those, at the expense of everything else. Thus we have "science fiction" shelves largely dominated by media spin-offs, "shared worlds," and an endless stream of trilogies. Many of these are written by highly capable writers who try hard to make them worthwhile—but they are not what these writers would *prefer* to be writing, and the time spent writing them is not available to work on the much more original things of which they are capable.

We have editors and publishers who say things like, "We buy authors, not stories," and apparently see nothing wrong with that. Few book editors have enough autonomy to buy books on their own best judgment; they must first sell each one to a marketing com-

*See, for example, Robert Silverberg's essay, "Gresham's Law and Science Fiction," in the opening pages of the anthology *Nebula Awards 31*.

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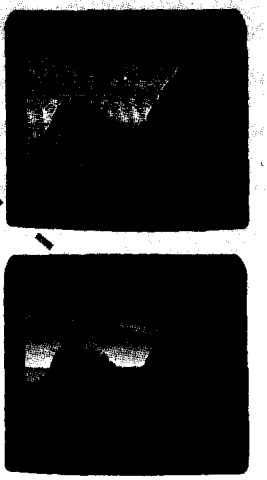

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mittee who are unlikely even to read it.

We do *not* have the diversity that we once did and many of us would still prefer. Writers whose work appeals strongly to a well-defined but relatively small market segment no longer have an outlet; the readers who constitute that market segment have no place to find what they really want. Writers get a few chances to produce a bestseller; if they don't, they then sell nothing or they write media spin-offs to pay the rent. Readers learn to love the "lowest common denominator" books or they do without; those with minority tastes are not worth publishers' attention. Which may, in the long run, prove a very shortsighted attitude. As Silverberg says, ". . . modern-day publishing's emphasis on the bottom line seems to be killing science fiction as an adult genre. I loved *Planet Stories*, sure, but I doubt that I would have stuck with s-f past the age of fifteen or so if I hadn't been able to move on to John Campbell's *Astounding* and Horace Gold's *Galaxy*."

•And, of course, we do have clear examples of accountant mentality in government, such as the recent movement to sell off national parks as a source of revenue.

Any individual, business, or organization, up to and including nations, must, of course, be fiscally prudent. But it is a serious mistake to make the bottom line the *only,* or even the primary, consideration in deciding how to live or do business. Maximizing the bottom line is fine, provided it's done in a way consistent with other goals such as living the way you want to and doing things you can be proud of. But that will not always maximize the bottom line, and maximizing is not always necessary.

Sometimes it's just necessary to have *enough,* not everything you conceivably could have. And if you have a good bottom line, you can afford to do some things that don't add a lot to it, simply because they contribute something worthwhile, or even admirable, to humanity.

Such sentiments are hardly new or original, of course, though they have been largely forgotten. For a particularly eloquent exposition that's been around for quite a while, I commend to you Eric Frank Russell's classic story "Late Night Final," which first appeared in these pages 49 years ago (*Astounding*, December 1948). It won't be easy to find, of course; in today's publishing climate, it's unlikely that anyone will have it in print when you look for it. But it's worth seeking out. And though the story was about a military invasion, the character Meredith's observation applies just as well to those who devote their lives to economic conquest: "If I, personally, were in complete possession of all the visible stars and their multitude of planets I would still be subject to one fundamental limitation, in this respect—that no man can eat more than his belly can hold."

Russell's story was about a civilization that had learned that lesson and thereby gone beyond the stages of succession I've talked about here. Can ours? ■

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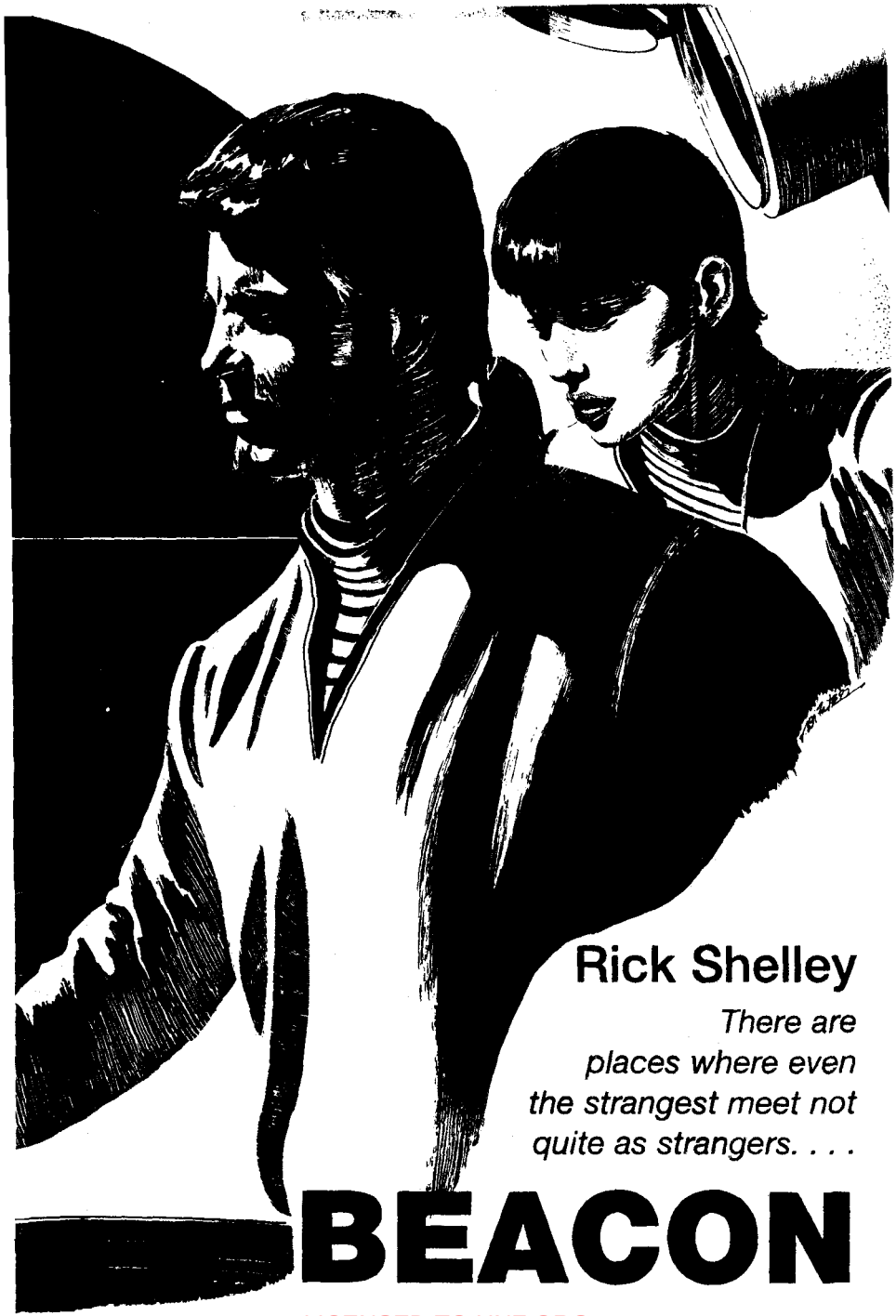

Rick Shelley

There are places where even the strangest meet not quite as strangers. . . .

BEACON

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The first thing you do, you make sure you've got air to breathe. If there's the slightest doubt of hull integrity, you hurry into a pressure suit. Everything else comes second.

Collision.

Ebeneezer's Candle did not take a high-angle hit, but she shook enough to turn me inside out and keep my head throbbing for a long time. When I got around to noting such things, there was a lot of dried blood on my face and in my scalp on the left side, from getting knocked around.

Ebbie's radars had given no warning of the debris hurtling our way. The reason for that was the same reason that we didn't take a direct hit. The front third of *Ebeneezer's Candle* was buried in a large cometary body and I didn't have the remote sensor packets deployed yet. They had been crawling toward their positions when two chunks of rock and metal shattered the berg, and sent ice and dust banging along Ebbie's body.

"Ebbie, talk to me," I said once my eyes quit spinning. I was watching air-pressure dials, wondering what the devil had happened and whether I ought to get into my pressure suit.

"Ebbie? Talk to me, girl." I know, it's inconsistent and illogical to give a ship a man's name and still refer to it, and to the computer's personality mode, as female, but that's the way it is. It's not just me, I promise.

"Evaluating." It could only have been my imagination, but Ebbie's voice sounded weak, confused—the way I felt. But the fact that it had taken her so long to respond would have been worrisome had I had time to worry about it.

"What hit us?" I asked.

There was another pause before she answered, "An object." If Ebbie were human, I would have said that it was a flip response, but I didn't think that she was capable of that. She started flashing screens of data at me, and I had those to concentrate on over the next several minutes.

The hull remained gastight. Once Ebbie assured me of that, I let myself take a breath or two and slowed my heart rate. Biofeedback. You have to remain in control no matter how close you come to the edge or how badly you hurt. And it was time to switch apparent time modes. We had done the "minutes squeezed into seconds" of an adrenaline rush. That was no longer necessary. I closed my eyes for fifteen seconds, holding my breath, as I tried to focus and step down from the danger high.

"Damage report?" I asked. This time Ebbie was ready, both with the good news and the bad. I already knew about the hull.

"Magnetic fuel containment remains nominal," Ebbie said. If the mag-barrels had given, I wouldn't have been around to hear that report. It was only the development of an antimatter drive that had made the round-trip times practical for humans to wander out to the Oort Cloud. At that, we still only skim the inner surface, the first few light-days of the cloud.

"There is, however," Ebbie continued, "damage to the primary exhaust cone, as well as damage to several maneuvering thrusters. We will be un-

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able to boost for our return to Mars Base as is."

"Alternatives?" I asked, swallowing hard over the news that Ebbie wouldn't be able to head for home.

"Recommend course change for Shipwreck Station 117+9," Ebbie said. "We can make that in twenty-seven hours at safe acceleration."

I spent several minutes reviewing data, but there was no real doubt. "Do it," I told Ebbie.

Nobody asked me, but *Oort Cloud* is the worst place name misnomer since Eric the Red named Greenland. The problem is that people have a very definite idea of what *cloud* means, even if they've never lived anywhere that has clouds. They think of fluffy atmospheric constructs too thick to see through, and somehow (in the case of the Oort, at least) impossible to penetrate. Or, if they've heard just a little about the area, they imagine a thick shell around the Solar System crammed full of dirty snowballs and rocks. Two seconds of thought should be enough for people to see the fallacies in that, but I guess a lot of folks don't use that much time on anything that doesn't concern them directly and immediately. If the Oort Cloud was *that* thick, we couldn't see the stars through it.

Even in the depths of the Oort space is mostly very empty. There are all of those comets and asteroids, some of them quite large—or we wouldn't be out here trying to make a living, but the truth is, we miners still have to hunt for good claims.

That's not to say that, once in a while, the neighborhood can't get too crowded for comfort. There is enough stuff on so many different tracks that there are collisions, and chain reactions. At times it can get too cloudlike for comfort.

I was near the end of my third deep expedition, so I knew the ropes. In the eight weeks since I had arrived from Mars, I had tagged six good claims—four rock and metal, two mostly volatiles—and boosted them toward rendezvous with catchers orbiting my home planet. People who have never done this for a living say that it's all in the computers, but getting your package to its destination with minimal loss, and with minimal delta-vee for the catcher to overcome is as much art as number crunching. That's why miners get half of the take, with the catcher and backer splitting the other 50 percent.

All I wanted now was one last good claim to boost home with. We always push the last one in.

I had found just what I had been looking for, a chunk of valuable ices three kilometers along its major axis, more than half that across the beam. Depending on how much my earlier claims assayed out for, and how my investments were doing, it might be enough to let me retire. Maybe *some* people mine the Oort for the sake of the job, but it has always been nothing more than a means to an end—a long and comfortable retirement—for me. The minute my accountant told me that I had enough to insure that, it would be "Good-bye candle ships" for me!

I had my candle nosed into the berg nicely, and was setting clamps to keep

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it in position, and moving the instrument remotes out when those chunks of metal ores collided with the berg.

Once I had confirmed that there was nothing I needed to do immediately, I went to my sleeping bag on the mid-deck and sealed myself in. There would be time for work, and worry, later. But until we reached the shipwreck station, it was better to husband my energy, and get as much sleep as possible.

There had been other damage to Ebbie, relatively minor stuff—seals stressed or cracked, bulkheads slightly deformed, even a couple of small leaks, but those had been patched automatically.

Candle ships are remarkably durable. They have to be, the way we use them. We push chunks of metal, rock, and ice around, many of them measured in kilometers. We make the long haul out and back in at accelerations of up to one-g, reaching peak velocities close to seven-tenths of the speed of light. There are millions of people on Mars, the Moon, and in expeditionary bases and space habitats sprinkled around the Solar System who depend on what we can provide to make it practical. It would be far too expensive, and destructive, to haul everything up from Earth.

"Tim, we will have company at the shipwreck station," Ebbie said when she noted that I had awakened six hours later. "We were not the only ones caught in the Event."

"A chain reaction?" I asked. You've probably seen the same demonstration I first saw when I was about eight years old. The bottom of a transparent cube is covered with old-fashioned backbreaking mousetraps, with table tennis balls resting on each. One more ball is dropped in the top, and pretty quickly all of the traps have been sprung and the balls are bouncing all over the place. A basic physics demonstration. Or, you might think of it as the break in a game of pocket billiards—in three dimensions with the balls ranging up to the size of mountains.

"So it appears," Ebbie said. "I am receiving incomplete information. Three of my antennas were damaged."

I pulled myself out of my sleep sack. Regardless of what you may have seen in adventure vids, we do not have artificial gravity, except what we get from acceleration, and Ebbie was just creeping along now with her damaged pipes.

"You do have a good lock on the beacon at the shipwreck station, don't you?"

"Yes, I have a double lock. I will get us there safely."

One of the staples of adventure fiction when I was a kid was the spaceship stranded in the unknown reaches of space, with some vital commodity in too short supply for the protagonist to reach safety. Then the author pulls some cute little trick out of a bag, the protagonist fixes the whoozis with a wad of chewing gum or something, and everyone gets home safe and sound.

Bull. All of the cute little gimmicks get engineered into spaceships as soon as the engineers think of them

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and find a cost-effective way to include them. You don't leave things to the dire-straits inventiveness of Wally Wizard and his electronic penknife. Things can still go wrong though. You can still get potted like the eight ball in the corner pocket. First in the asteroid belt, and later on when we started venturing out to the edges of the Oort Cloud, the engineers took a cue from Earth.

Back when sailors got their feet wet and the southern oceans were vast tracts that needed weeks or months to cross, some maritime powers established shipwreck stations on remote islands, refuges with stocks of food and other necessities and (once they had been invented) radios to let marooned sailors call for help.

In the same way, shipwreck stations were put in space. Theoretically, there was always supposed to be one within reach of a candle, even one left with only maneuvering thrusters, quickly enough to keep a miner from asphyxiating or dehydrating first. They had been mass produced and sprinkled all along the inner edge of the cloud, as deep as miners normally ventured.

"Will there be room for us to dock for repairs?" I asked.

"We will be the second ship in," Ebbie said. "At least one other candle will follow. Another might need to."

The shipwreck stations were not crewed. They were just temporary refuges available to anyone who needed them—small gastight habitats with fuel, food, water, oxygen, and the most basic repair facilities. If a ship needed more repairs than her pilot could manage with the available resources, they would have to wait for a ride and a tow—expensive, time-consuming, and very high on any pilot's list of least-favorite things.

"I have been able to dampen the vibrations in one of the maneuvering thrusters," Ebbie reported. "That has allowed me to boost our acceleration by zero-point-eight percent."

Which would get us to the shipwreck station just a little faster. "As long as you're certain that it's safe, Ebbie." That was unnecessary. Ebbie's independent decision parameters are more closely circumscribed than mine.

"It is safe," she assured me.

I chatted with the two other pilots who were heading toward the same shipwreck station, and with the maybe—who decided that she could make it home without a repair stop. Angie McBroom was nearest docking. Her candle ship was also apparently in the worst condition. It probably would not be possible to repair the candle to make the trip back under its own power. But Angie wouldn't concede that until she could get out and make sure for herself. Clayton Reid was farther out, but not in much worse shape than I was. We both anticipated being able to boost for home, even if we might not be able to risk picking up another berg to push in.

"If it's at all possible," I told Ebbie after signing off from my second conversation with Clay, "I want to take something home. It might yet be possible to earn retirement on this trip." But not if Ebbie deadheaded back to Mars.

"Too soon to tell," Ebbie said. "Re-

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pairing the main exhaust might be tricky. I anticipate that we can do a good enough job to get us home, without much loss of time over a normal return, but I cannot tell if we will be sound enough for a tow."

While the shipwreck stations were being planted on bergs in relatively stable orbits, it was a matter of intelligent self-interest for miners to clear away the bits of rock and ice that might pose dangers to those stations. It's an ongoing process though, since there is an almost Brownian motion within the cloud, new material moving toward the verge of the shell almost constantly. Whenever a new object is detected moving into an orbit hazardous to a shipwreck station, there is a small bounty added to the miner's normal take for the claim.

A major event like the chain reaction that was moving three ships toward the same station, could rearrange the entire neighborhood. It would probably move more rocks and bergs into position to qualify for bounties. A major event could also damage or destroy a shipwreck station. We didn't know until Angie reached our common goal that 117+9 had also been hit.

"The station remains habitable," Ebbie said. "Its orbit has been affected though, and one supply cache was destroyed. The change in orbit will move it toward the inner Solar System, making it a long-period comet."

Which would make it useless as a shipwreck station. It would have to be boosted back into its previous orbit or replaced. That wasn't our problem. Ebbie assured me that the deviation was too slight to have any immediate impact.

"Will the destroyed cache leave the station short with three of us docked?" I asked. The pause before Ebbie replied this time was her way of letting me know that she had already computed the data out to more decimal points than I could grasp, not because she was processing information.

"No foreseeable shortages. Repair facilities will be marginal. Six percent of the cometary body was destroyed."

"Will we be able to make our repairs?"

"Most likely," Ebbie said. "If you want the percentages, over 92. *Bartholomew's Candle* will not be so fortunate." That was Angie McBroom's ship. "Before, she had no more than a 5 percent chance of making repairs sufficient to reach Mars. This has erased that hope. She will have to wait for a ride home."

I had spent a lot of time alone with Ebbie, over three tours out to the cloud. There have been months at a time when she was my only "human" contact. I knew her patterns.

"Even if the station's orbit does not degrade enough to be dangerous by then, there won't be enough supplies to hold Angie until a relief ship arrives," I said.

"Zero chance," Ebbie said. "Barta could sustain her that long, but Barta is so crippled that the risk is unacceptable."

And Angie would never willingly abandon Barta, even though the ship could be retrieved later. I couldn't en-

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tirely fault Angie for that. I'd be as hard to separate from Ebbie, out in the cloud. A pilot who comes home without his or her ship doesn't have much future in the business.

"I guess that means that one of us will have to give Angie a tow," I said. Either Clayton or me.

"That would seem to be the logical solution," Ebbie said.

I growled at the way she used the word *logical*. It was a code to tell me that after all, Ebbie was the computer and had the massive brain and faster thinking than I could dream of, and when she said something was right, *logical*, that was that.

"Maybe Clay will volunteer," I suggested after frowning at the nearest monitor.

"I suspect that that is slightly less probable than our claiming an asteroid that turns out to contain ten thousand tonnes of gold," Ebbie said.

If it had been me speaking, I might have left out the word *slightly*. We're all somewhat antisocial or we wouldn't take jobs that keep us alone for up to three years at a stretch. But Clay Reid was the archetypal loner. If he were the only one available to do a rescue, he would do it. Anyone out in the cloud knows how thin the thread of survival is, but Clay would not do it with grace. He disliked everyone.

"Well, we'll worry about that when we have to," I said. "Let's make certain that you're going to be in shape for that sort of work before we make offers."

Getting to the shipwreck station was not just twenty-seven hours of eating, sleeping, and hanging around. No matter what Ebbie is doing, I have a full schedule, most of it involved in just keeping my body in condition. Long periods of weightlessness leach calcium from bones, endanger muscles, and play havoc with the circulatory and digestive systems. Granted, things aren't as bad for me as they were for early space travelers. For one thing, I was born on Mars and grew up adapted to that much less gravity. And there is the physiological tampering they do on us, the scavenger cells—biological nanomachines—mucking about inside us trying to haul the calcium back where it belongs, and so forth. But we still need plenty of plain old sweat equity to keep the body in tiptop shape. No miner wants to spend two or three weeks rehabbing on Mars after a deep tour.

A berg is just a dark blob of matter. Without the beacon marking the shipwreck station there would have been nothing to distinguish that lump of ice and dust from millions of others in the halo that marks the edge of the Solar System. The beacon is electronic. A visible searchlight powerful enough to be seen at any distance would take far too much power to be practical—it would melt the berg it was mounted on. But as Ebbie maneuvered us in to dock, there were lights visible, small markers on *Bartholomew's Candle* and on the station itself. I guess Angie wanted to make double certain that Ebbie saw Barta and didn't plow into her.

Ebbie gave me several views of the damage to Barta. It was fairly obvious

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that Barta wasn't going very far on her own power without a major overhaul. It might even be decertified for deep operations. The ship would likely not be scrapped though. There are uses for the most beat-up hulks. While Ebbie moved us up to a docking tube at the station, I got a good look at most of Barta's hull. I could only recall seeing one candle beat up worse, and her pilot had not survived.

"Angie McBroom was one lucky miner," I whispered.

"Luck may have had some part in it, but Barta is a good ship." There was a hesitation before Ebbie added, "Or was."

"I was thinking that too. Her long-haul days may be over."

"Barta won't like the alternatives," Ebbie said.

I looked toward the speaker grille, as if I might see Ebbie in it. We had been together a long time, spent ages conversing when we had no one else to talk with. I did think of Ebbie as a person, but only to a point. There was always the distinction, finally, that she was still only a computer.

"She won't *like* the alternatives?"

"The word was appropriate," Ebbie replied, her voice matching mine closely in tone. "I wouldn't either."

"I'll keep that in mind," I said. "I'm not sure how I'll adjust when I'm not making long hauls any more myself."

Ebbie had no response to that. She retreated to business.

"Twelve seconds to touch," she informed me.

As usual, she performed the docking maneuver perfectly. It's a big part of our business, and in this case she didn't have to burn us part-way into the berg or calculate a balanced position so that we could boost it accurately home.

Angie McBroom was waiting when I cycled through the habitat's airlock. She gave me a weak smile and a thumbs-up gesture while I climbed out of my pressure suit. The berg had just enough mass to give a slight feeling of weight, enough to keep me oriented and make it simple to slide the suit down so that I could step out without turning somersaults.

Angie was particularly tiny for Mars-born, but most miners are below average in size. Our candles don't seem as cramped as they would if we were two meters tall. Angie had been at the business longer than I had. This was her seventh trip. According to rumors back at Lowell Port, she had the money to retire twice over, but kept going back out. I had known her, or known of her, for as long as I had been in the game. She was a legend in the Miners' Guild. And we had talked by radio quite a few times.

Still, this was the first time I had ever laid eyes on her. She wasn't nearly as old as I had expected. Everyone talked about her as "the old lady of the Oort." Seven trips had to translate to at least twenty years, even if she had always dipped only into the very edge of the cloud and taken minimal stopovers on Mars. She had to be forty or more years old. But I would have guessed that she had to be under thirty-five, maybe only a year or two older than me. Her round face had tiny lines at the corners of her eyes,

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but many miners acquire those their first trip out. Her complexion was pale. There are no suntans in the Oort.

"You're a sight for sore eyes," she said.

"Your eyes don't look all that sore." I laughed.

"What's so funny?" Angie asked.

"All of the times we've talked, and all I've heard about you, it just seems strange, meeting for the first time."

She shrugged. "That's the nature of the beast."

"Ebbie gave me a good look at Barta. Looks like you've used up a couple of your spare lives on this trip." I moved to one of the benches and sat, then stretched before I took the elastic band off of my ponytail. I start every long haul with my hair shaved to the scalp, but the next haircut has to wait until I get home. You don't want hair clippings floating around inside your ship, getting into places where they might do harm before they can be sucked up. I don't even shave aboard Ebbie. I glanced around the habitat. I might whack off my beard and some of the hair while I was in the station, if I could find the tools.

"It is bad," she agreed. I might have imagined that I saw ghosts race across her eyes. "It'll be the devil to fix." She sat on the bench with me, but not too close.

"Ebbie says we'll be able to fix her up good enough for the trip home, probably good enough to give you a push." I know, I wasn't going to say anything until I knew for certain that Ebbie would be in shape for that kind of work and that Clayton wouldn't do something completely out of character and volunteer, but that haunted look on Angie's face changed my mind.

"Thanks. I want to give Barta a closer look first, make certain that she can't get home by herself."

"You know that the station won't support you until a relief ship can get out here to do the tow," I said.

She hauled in a deep breath. "I know. Rotten luck, huh? The worst chain reaction since I've been in the business. I only know of one other case when three ships were damaged by the same event, and that was when I was a kid."

"Two pilots didn't make it back from that one. I guess that makes our luck pretty good by comparison, even Barta's."

"Nobody told me you'd become a chaplain."

I laughed. "Clay Reid will do that before I will."

She joined me in the laugh. "I am glad I'm not going to be stuck here alone with him. I'd want to sleep with a knife in my hand. I've met him a couple of times, back at Lowell Port."

"How long before he gets in?"

"Three hours. He says he plans to be back out seven hours after that."

"You didn't try to argue him out of the fast turn-around?" I tried to sound surprised. It was enough to get another slight laugh from Angie.

"I'm glad you got here," she said. "I've been doing nothing but feeling sorry for myself."

"If we're ever at Lowell Port at the same time, you can buy me a beer."

"I'll do that. How much damage

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does your Ebbie have?"

I gave it to her briefly. "Ebbie says it should take about ten hours work to get us shipshape for the long push home. Three sessions outside, two if I really push myself."

"I'll give you a hand, once I make sure that I can't get Barta up for the trip under her own power. Make sure you get things right." I didn't try to refuse her help. With two people working, the job would go much faster.

We spent an hour going over the radio traffic, making certain that we hadn't missed anything pertinent. The only talk going on was out in the cloud, and fairly close. Home was six months off by radio. There could be no advice from there, and there was no hurry in notifying Lowell Port. Even the permanent stations most distant from the Sun were four light-months from Shipwreck Station 117+9. The talk was with other pilots skimming the cloud, and there were only two close enough for conversation—Clay and the miner who had decided not to head for the station after all. The rest were between ten and thirty light-minutes away.

The event was still in progress. That's part of the problem with a chain reaction. Anything that gets bumped has its orbit and momentum changed. Collisions lead to more collisions, and to more changes in the orbital schematics. It would take time to get the new map finalized. But farther off there was less chance of ships being damaged. The warning could travel faster than rocks and bergs. People could get out of the way.

Angie went to do her second survey of the damage to *Bartholomew's Candle*. It wouldn't change the bad news. We both knew that, but she tried to sound optimistic, and I didn't tell her that she was wasting her time.

Clayton Reid's ship docked while Angie was getting back out of her pressure suit. Reid had never given his ship a name. It was just "Clayton Reid's candle." Knowing that Clay was about to touch, I tensed up, as if I expected him to bump us hard enough to feel the docking. That was ridiculous, of course.

"I hope he's in no hurry to come in," Angie whispered. Viewing the damage to Barta had been rough on her. The more time Angie had before we were graced with Clay's presence inside the habitat, the easier she would find him to tolerate.

"If he's planning to be on the wick in seven hours, he's going to have to get busy right away," I said, also whispering, as if I feared that he might hear us talking about him.

The radio chirped for attention. I went for it.

"I'll be starting my repairs right away," Clay announced. "I'll be in when I need to recharge my tanks."

"Come on in whenever," I said. "But if you've still got enough full air tanks in your candle, you'd best recharge there. The station lost part of its supplies in the event."

He growled but said, "I'll do that." I hadn't given him much choice, the way I had phrased it. Even Clayton Reid had to respect the needs of the shipwreck station.

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After I had switched off, I turned back toward Angie. "That buys us a little time without his presence. Maybe I pissed him off enough that he won't come in at all."

"It's possible," Angie said. That half-smile came back to her face, briefly. "Now, what about looking after your Ebbie?"

In an emergency, I could have attempted the repairs to Ebbie anywhere. But when you're perhaps weeks away from any help at all, and five or six light-months from home, you don't take any chances that aren't absolutely necessary to assure your survival. Going outside to fix your candle when you're on your lonesome presents routine dangers. If you screw up, you don't have any backup.

Having an extra set of hands available speeded up the work considerably. There was only one place where Angie and I had to set up a mechanical persuader, a lever to hold a piece in place while I ran the cold welder to repair a fitting. Without her help, I would have had to do that a half dozen times.

After one two-hour work session, there was only one critical repair—and two or three minor jobs—left. At the far side of the station, a kilometer from Ebbie, we could see Clay working. He hadn't so much as given us a wave when we came out.

"Let's take a break," I told Angie. "We're making good time. There's no need to press ourselves too hard."

It can be tiring moving around and doing anything physical in a pressure suit, even in micro-gravity. In some ways, that's harder than working in full planetary gravity. And despite the best innards in our pressure suits, it can get chilly spending extensive time outside that far from the nearest major source of heat—that is, the Sun.

When we were back inside the habitat and out of our pressure suits, Angie cranked up the thermostat a couple of notches. I heated a couple of bags of coffee.

"Ebbie wasn't hurt as badly as I had thought from the reports Barta got from her," Angie said.

"We were lucky," I admitted. "We shouldn't have any trouble at all getting Barta home for you."

"But you'll miss a chance to push a paying load home." She sounded reluctant to mention that, but Angie hadn't earned her high reputation among the mining community by shunning inconvenient facts.

I shrugged. "That's life in the pits. We may be loners, but there are still times when we need each other."

"Just tell me when you want to go out and finish the work."

"We ought to take at least an hour between. Give the suits time to get back up to speed. Then we can look at the repairs we did the first shift before we tackle the remaining work, make sure I didn't screw anything up."

"Not likely."

The hour stretched past an hour and a quarter. I was very comfortable sitting where I was, and I was enjoying my chat with Angie. It was warm in the habitat and I was feeling a little drowsy—and contented.

I yawned and stretched, having a last

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little argument with myself on the subject of getting back to work. I had just about convinced myself that it was time to get productive again when there was a buzz from one of the instrument clusters on the far wall. A small blue light started to flash.

"What the hell is that?" I asked. The question was enough to get me to my feet and moving. Angie was faster. She got to the panel and punched a couple of keys.

"There's another ship coming in, but it's not making any signals and not answering the station's queries."

"Try it manually," I said, a waste of air since she had already started doing that.

Angie tried all five standard communications and distress channels. I worked the radar panel, trying to get better resolution. But the station's damaged antennas kept the picture generic, so I patched through and let Ebbie do the scanning.

"This doesn't make sense," I said when Ebbie fed me all of the data she was getting.

"What?" Angie asked.

"Ebbie's got a full EM scan going. The shape isn't right and the heat signature of the main propulsion unit is all wrong, like nothing I've ever seen."

It wasn't that Angie didn't trust my report. She just wanted to see for herself. And it can help to have a second set of eyes, and a second brain, scan suspect data. We both stared at what Ebbie was providing.

"The silhouette I could understand," Angie said finally, "if the candle had serious structural damage. The lack of any radio traffic could also be a result of damage. But that electromagnetic scan is *all* wrong."

"Any guesses?"

"None that I care to voice. I don't want people to think I've finally flipped my dish completely."

"A new ship design?" I suggested. "Something on its first trip out here?"

She shook her head quickly. "We would have heard if there was anything that radical in the works."

"Maybe it didn't come from Mars or one of the space habitats that support the guild. Could it be that Earth has decided to get back into the mining game?"

"*That* we would have heard about even faster," Angie said. Earth had been pretty much shut out of the deep mining business decades before. They couldn't compete. The depth of Earth's gravity well imposed too much overhead. Even for the things Earth needed she had to come to the Mars-based mining co-op, and the Miners' Guild.

"If it's not ours and it couldn't have come from Earth, that pretty much only leaves one other possibility," I said. I was almost as reluctant to voice that alternative as Angie was. "It must be coming from the other side of the cloud."

We stared at each other. *This can't be happening*, I thought. It had been 147 years since Tara Jewel O'Brien, the first child born off-Earth, and people had been looking for aliens for at least 90 years before that. Every search had turned up blank. Most folks had finally started to discount the possibility that we would ever

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find anyone else.

"There has to be another explanation." Angie spoke very softly, and there was almost an edge of fear in her voice.

"You'd think so," I replied. I got back on the radio to Ebbie. "Analyze all of the data about the new ship. Give me your best estimate of its nature and origin."

Ebbie took more than a minute to respond. The delay told me as much as the words she finally used. "The vessel is of unknown type and origin. It does not conform to any specifications in my database, nor can I extrapolate circumstances which might have contorted any known objects into these figures."

What I wanted most was the chance to communicate with home, get advice from all of the experts that Mars, Earth, the Moon, and all of the habitats could find. But that would take nearly a year, just for the round-trip communications time, and all we had were hours before the ship, or whatever it was, arrived.

I had just got to the point of deciding that it was time to tell Clay about our mysterious visitor when he came into the habitat and started to strip out of his pressure suit.

"There is an anomalous vessel, or something, approaching," he announced as soon as his helmet was off.

"We know. We've been trying to figure out what it might be. It doesn't conform to any known pattern."

"There is a chance that it is of alien origin," Clay said, words delivered from the Mountaintop.

Angie and I exchanged a glance. "I think we'd better finish the work on Ebbie while we can," I told her.

Clay never got all of the way out of his suit. He was sealed back in and through the airlock before Angie and I could get suited up.

It was, to understate the obvious, a distraction. I wanted to have Ebbie ready for a hard push home before the alien ship—if that was what it was—reached the shipwreck station. If the ship was following the beacon in and not just passing by. Part of me, a *large* part, wanted to get the repairs completed, dock Barta to Ebbie, get Angie aboard, and light the wick for home before the newcomer arrived. I had the distinct feeling that history was about to be made . . . and I would have just as soon avoided it. It might be uncomfortable, if not lethal. I would gladly have given Clay the honors if he had asked. The words would have been out before my brain could censor them.

But Clay was never the cooperative sort.

Angie and I kept links open to the habitat's instruments through Ebbie. She also kept track of Barta that way. Ebbie ran diagnostics to track the progressive systems failures aboard Barta. Before much longer Angie would have to put her ship in sleep mode, with only the most essential services running, if she wanted to save anything.

"There, I think we've got it," I said after we had been out for eighty minutes. "I'll tell Ebbie to run her complete preflight checklist. That'll take

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twenty minutes. If she says it's OK, we'll start worrying about getting Barta docked to her."

"You want to do that right away?" Angie asked.

I nodded. "I want to be ready to light the wick at a minute's notice, if we have to."

"That's probably wise," she agreed. She turned, not quite enough to really see Clay, but enough to get me to glance his way. "I think he feels the same way. He might not even wait to see who our visitors are."

"How do you feel about it?"

"I haven't made up my mind. If we left first and never found out who or what is coming, it would plague me the rest of my life, but finding out could be even more unpleasant."

Angie was looking up, out in the direction of the radar contact—not that we could see anything yet—rather than at me, so she couldn't see my grin. "I know exactly how you feel," I said. "I've been having the same debate with myself."

We moved into Ebbie to wait for her to complete the diagnostics. As soon as Ebbie gave the OK, we would do the rest of the work. Mating the two candles right at the shipwreck station would be touchy. The easy way, the *by the book* way, would be to back both ships a dozen kilometers from the surface of the berg, then do the snag-and-hug. But we couldn't rely on Barta for her half of the work. Ebbie's thrusters had enough cold gas left for her thrusters to enable us to do the job in close, though.

"Everything checks out nominal, Tim," Ebbie said after the last test. "We won't have any difficulty at all getting home with Barta. And I should need only minimal work at Lowell Port to be ready to head out again."

"That's good to hear, Ebbie. We're going to mate Barta and get us ready to leave in a hurry if we have to. You understand?"

"I do, Tim. I have been making my preparations based on that assumption. Will we be leaving before the anomalous object gets close enough for visual identification?"

"Probably not, but that is subject to change. We might get cold feet and change our minds. Just be ready for either."

"Of course."

"Angie, do you want to do this from here or go over to Barta for the docking?"

She hesitated. "I'd like to be with Barta, but that might complicate things afterward. I'll stay here, if you don't mind."

"Not at all."

Before we started docking maneuvers, I warned Clay and gave him time to get inside or on the lee side of his candle, in case something went wrong.

"Do it gentle, Ebbie," I said once Angie and I were strapped in. It was the first time that the second seat in Ebbie's control cabin had ever been occupied. It folded out from under the secondary control station. With both seats down and in use, there was hardly room to move between them.

Ebbie backed away from the station as softly as could be, and swiveled until her nose was pointed at Barta's

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side. Angie was linked to Barta, making certain that she knew what was going on and didn't activate collision avoidance maneuvers by mistake. I assume that Ebbie was also communicating with Barta. Ships normally talk with each other like that, even when they're not getting ready for intimate relations. I sometimes think that the candles talk to each other more than their pilots do.

I watched my monitors and gauges, hands poised to take manual control in the unlikely event that something went wrong with Ebbie's automatics. I suppose that I held my breath at times as well. I didn't want *anything* to go wrong, especially anything that might mean that we wouldn't be ready to light the wick in a hurry if we had to.

Nothing went wrong. When it was over, Ebbie was sideways to the docking tube, anchored thirty meters off the end, hooked to it by three cables. Docking at a shipwreck station with a tow buckled on is not Standard Operating Procedure.

Angie and I would have to work our way down—and then back up—those cables unless we chose to stay aboard Ebbie and not return to the station habitat. I gave Angie the choice.

"Let's go down," she said. "If we're going to stick around long enough to see what's coming, that's the place to do it."

"Just remember, we may have to shinny back up the cables in a hurry when that ship gets here."

We took our pressure suits off and used station stores to charge the maneuvering-gas tanks in them, although we had charged the air tanks from Ebbie. About ten minutes after we had settled in near the habitat's instrument console, Clay came back in.

"I have finished my repairs," he announced.

Bully for you, I thought. What I said was, "Are you going to leave now or wait to see what's coming?"

"I will stay for now," he said. "At least until we have a clearer idea of what the anomaly is."

"Yeah, us too," I said. By the partly written rules that we govern ourselves by, we should have left the shipwreck station immediately after completing repairs and getting Barta docked to Ebbie. At the very least, we should have quit drawing on station supplies, leaving as much as possible in case someone else needed the facilities. But I suspected that we would have drawn more complaints had we not stayed around this time. If we left before finding out what was coming, no one would have ever let us hear the last of it. Besides, with 117+9's orbit decaying, it would require major attention soon anyway.

"The object has started slowing down," Angie announced. "It is definitely coming here, not just passing by."

"How long?" I asked.

"If it maintains its current rate of deceleration, just under two hours."

Two eternal hours. The ranging gear gave us improved definition on the object. The scanners refined the spectrum of its emissions. The object

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was definitely a ship, but absolutely not of any known human manufacture. And the crew, if there was one, was not answering radio calls.

At first, Clay had taken off only his helmet. But keeping the rest of his pressure suit on apparently became too much of a burden because he took it off eventually, then put it on again no more than twenty minutes later, forty-five minutes before the mystery ship would arrive. Ten minutes after that, Angie and I got back into our suits as well.

"A prudent step," Angie said when I made the suggestion.

"In case we have to run for it, or decide to leave early," I said, trying to whisper softly enough that Clay wouldn't hear.

We had a visual on the ship by then, not that it was very revealing. Even at extreme magnification the image wasn't very clear. The ship had come in hotter than any of us had, which meant that it had to decelerate more rapidly to match speeds with the shipwreck station for rendezvous.

I fought the urge to go outside and watch. Even if the ship had been a candle with a pilot we knew (and trusted), that would have been poor judgment. In case of mishap, we would be safer inside the habitat, especially sealed in pressure suits. Of course, we would have been safer yet in our candles, backed away from the berg and ready to light the wick . . . and safest of all several hours out, burning for home. But we had already made the decision not to go, and no one suggested a change of plan.

Clay started to fidget and pace. With as little room as there was in the habitat with three people dressed in pressure suits, that was annoying. It appeared as if he might be having difficulty fighting the urge to move to his candle.

"That ship is definitely not of human manufacture," Ebbie informed me eight minutes before its ETA. "It appears to be totally alien in design."

"Could it be only partly alien?" I asked without thinking.

Ebbie did not respond.

Six minutes out, the ship increased its rate of deceleration. Then the hot drive was turned off and the vehicle edged its way in to final rendezvous with cold gas, reversing attitude so that the exhausts would remain away from the berg. The ship might be alien, but there are certain necessities that remain the same as long as the propulsion systems aren't totally beyond our ken. The same basic mechanical needs. The laws of physics *had* to be the same for them as they were for us. That had to limit the *alienness* of the ship. It was a third larger than Ebbie.

"A little shaky coming in," Angie commented softly.

"That ship looks as if it's been beat up worse than Barta was," I replied. "Maybe the pilot was injured, or just hasn't gotten his nerves back."

"He's going to park awfully close to Barta and Ebbie. Maybe we should have waited aboard," Angie said.

"I just thought of something."

"What?" Angie turned from the monitor to look at me.

"What the hell do we say?" I said. Even Clay turned to look at me.

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"Some alien creature finds his way through the airlock and comes in the door." I pointed at it. "What the hell do we *say?* Are we going to be able to communicate at all?"

I hadn't given those questions any thought in the hours of waiting. It was too . . . preposterous a notion that after all of these decades, we were actually going to meet an alien. Face to face. Assuming that the alien had a face.

"There's no way to know," Clay said. "Perhaps we would have been wiser not to put ourselves in the position where we might have to make the attempt . . . or suffer the consequences."

"There must be a pilot, maybe more than one," Angie said. "No matter what he or they look like or come from, they can't be that much different from us. From the looks of that ship, they might be in the same business we are, mining the cloud. If he, she, or they need help, we have to try."

I guess it did come down to that, we would help if we could. I doubt that I would have put it in words the way Angie had though. I would have been afraid of sounding stuffy or trite.

Time for reflection was running out. On balance, that might have been a definite asset.

The alien ship was not equipped with standard docking gear (standard for *us*, that is), so it couldn't link to the shipwreck station the way that the three of us had originally. Instead, the alien ship deployed three grapples, the way Ebbie had after docking Barta, and then extended a long bar, a probe of some sort, to secure its anchorage, about the same distance above the berg as Ebbie, one hundred meters from Ebbie and Barta.

We had excellent views of the ship now, up close and personal, both from the habitat and from Ebbie's cameras. The alien vessel was thicker and longer than our candles, and the general layout appeared to be a separation into three clear segments, with the rearmost—propulsion—the largest by far. The forward section was the smallest.

There was nothing particularly remarkable about the skin of the alien ship; undecorated metal, much the worse for wear. There were several small patches of some sort of characters on the hull. They looked faded in visible light, though Ebbie said that they were much brighter in ultraviolet.

"If someone walks in and says, 'Take me to your leader,' I'll die laughing," Angie whispered.

"I think I'm going to be afraid to do much of anything," I said, not looking at her. "I'll be too scared to even faint. I mean, what would they think polite, or a deadly insult? We've got no rule book for this."

The wait, even after the alien ship had docked, seemed eternal. If I were solely dependent on my own recollections, I would swear that it had to be ninety minutes from the time the ship planted its last grapple until the hatch on the forward segment opened. Ebbie assures me that it was only seventeen minutes though.

"We'll have to operate the airlock from in here," Angie said, moving to-

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ward the controls.

"We don't know if our visitor or visitors breathe oxygen," Clay said. "Or if any of the other components of our air might be poisonous to them."

"We can still open the door," I said. "If they're not certain about our air, they can stay in their pressure suits."

Pronouns had been a bit of a problem. We didn't know the number or sex of whoever was in that ship. It was enough larger than our candles so that the front segment could hold two beings roughly the size of humans, even for a long voyage. The hatch, at least, appeared suitable for human-sized bipeds.

Obviously, none of us were prepared for what *did* emerge from that hatch.

My first impression was that any of us could have worn the alien pressure suit. The proportions of arms and legs to the torso and to each other weren't quite right. Both sets of limbs appeared equal in size, and the feet seemed to be radically different from human feet. Judging solely from the suit, the alien might have had a horse's hooves.

But there was one much more glaring difference. There was a large spherical protrusion from the chest of the alien. From the scaled-down view we had on the monitor, it looked as if he or she was wearing a second helmet there.

The alien came down one of the cables holding his/her ship to the berg, using only the upper limbs to maneuver. The pressure suit's gauntlets had two segments for digits, like mittens but with both portions equal and opposite each other. He or she made directly for the airlock door.

Angie had already pumped the air out of the airlock. Now she opened the outer door. The alien entered without hesitation. Angie closed the door and started to pump air back in.

"Now we find out," I said. I would have given almost anything to be anywhere else in the Solar System, even on Earth—the one place I had always sworn I would never visit.

Clay and I moved farther from the door. Angie couldn't move until she hit the button to open the interior door. She hesitated, but not pushing the button would not give us any safety. There was a large button on the other side of the door so that it could be opened from inside the airlock. Even an alien would probably deduce that in seconds.

"Go ahead," I whispered.

She pushed the button.

My heart thumped wildly. Fear was not a new companion, but he was a lot closer, more overpowering, than in a long time. While we waited for the alien to cycle through the airlock I had a flashback to the first time my father had taken me out of the pressure dome back on Mars, my first time out on the surface. I *knew* that people frequently went outside the dome. Some people worked out there every day. There were accidents, but not often. It was safe or my father wouldn't have taken me. He told me that. I believed it. Still . . .

This time I didn't have anyone's assurance that what we were doing was

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safe. There were no statistics, no precedents.

The door opened. The alien stepped into the room, staggered, then caught his balance, reaching out to put a hand against the wall. With feet spread wide, he looked not at any of us but at a gauge on the left sleeve of his pressure suit. Then he reached up, twisted his helmet, yanked it off, and dropped it.

Then he collapsed.

As dramatic entrances go, that one would be hard to top. It was worthy of the professionals at the Bradbury Theater in Lowell Port. It was also a terrific ice-breaker. Our tension, fear, gave way to instinctive concern. Even Clay took a step toward the fallen alien before he thought better of it. Angie and I kept moving. One of us knelt at each side of the alien, wanting to help even before we realized that we didn't have the faintest idea where to start, or what might be wrong with our visitor.

Our first close look at the alien's face did bring us to a complete stop though. The contours of the face were . . . lumpy. If you've ever seen a picture of the surface of a human brain with all of its convolutions, that was about how the alien's face looked. The color was yellow ochre, various shades from the dark of the folds to the lights of the high points. There was no protruding nose, but what I took to be a pair of wide, angular nostrils between and only slightly below eyes that were set widely apart. The eyes were closed. Lips were more pronounced folds in the skin, and the same color. The mouth was a twelve-centimeter-wide gash across the bottom of the face. There was no hair or fur to cover the skin.

Ugly as sin, I thought. OK, that was a xenophobic, insensitive reaction, but I did feel a real physical revulsion. My stomach announced its displeasure in a sudden cramp. I fought the urge to turn away, to look anywhere but at that face. Still, I wasn't prepared for when Angie gave a terrified scream.

I looked at her. The color had completely drained from her face. She was pointing down at the protrusion from the alien's chest. I had almost forgotten that. I turned and looked.

Even with the warning of Angie's reaction, I almost screamed as well. It *was* a second helmet, and there *was* a second face, a second head, looking out of it. Dark brown, almost black, eyes, shaped like a cat's, were staring at me, but the eyes seemed not to be seeing anything.

I lurched to my feet and took a step, almost a jump, back. When I looked around I saw that Clay had moved closer. He had been standing behind me, looking over my shoulder, and he had to move in a hurry when I leaped to my feet and backpedaled.

"That doesn't make sense," he said, looking at the alien's second head. "No sense at all. It can't be." He sounded offended by the extra head.

"Write a nasty letter to Darwin," I said, choking back the urge to vomit. Logic be damned, the sight outraged my instincts.

"What do we *do?*" Angie asked, looking up. She hadn't moved from the alien's side, other than to lean

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back on her haunches. "He's still breathing. *This* head is, at least," she added, pointing at the one that was in the proper position.

"What the hell can we do?" I asked. "We don't know anything about his physiology." I was staring at the extra head. "We couldn't know if we were doing the right thing or not."

"We've got to try something," Angie insisted. "At least help me get him out of this pressure suit. Maybe that'll give us a better idea what to do."

And maybe it would bring more revolting surprises.

"Perhaps pure oxygen will bring him around," Clay suggested.

I turned and gave him a glance, moderately surprised that he had actually come up with a suggestion that sounded good. But maybe I also resented the fact that he had been able to think more clearly about the situation than I could.

"Get an oxygen bottle then," Angie said. "Tim, help me get this suit off of him."

I got back down, steeling myself for whatever we might find. Getting the alien out of the suit was a larger task than it sounded. The fittings were different, and not all that obvious. The secondary head complicated matters. We didn't know the why of that until we finally did have the pressure suit off.

The second head had been coarsely sutured to the alien's chest. The extra helmet had been glued over a hole cut in the pressure suit. There was a lot of what we assumed was blood staining the alien's clothing.

I had to stop and take my own helmet off in a major hurry. Vomit is one hell of a mess inside a pressure suit, and the smell remains almost indefinitely afterward. I barely made it. Angie had even less time to spare.

"My God!" Angie said once she was again able to speak without retching. "What went on here?"

The alien's tunic had been ripped open down the front. The neck of the second head had, as far as we could see, then simply been sewn to the chest, assuming that the area corresponded to the same area on a human.

"We'll never know if we can't keep this alien alive," Clay said. He had brought over a portable oxygen canister, complete with face mask, tubing, and a pump-bag. He got down next to the alien and started the oxygen—placing the mask over the head that was where it belonged.

"Why don't you see if you can get inside his ship?" Angie said, looking at me. "Maybe you'll find something to tell us what's going on."

"You mean like the rest of him?" I pointed at the second head. My hand shook so badly that I pulled it back in a hurry.

"Whatever," Angie said. "Anything."

I nodded. *I just hope there aren't any more of them,* I thought. It didn't seem likely that there would be another whole alien in the ship. If this one had had help from another of his own kind, would he have left his ship and come to us?

I didn't think so. I hoped not.

There was a definite sense of relief to stepping inside the airlock and seal-

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ing the inner door, shutting me away from the peculiar alien with two heads. Clay had been right. That made no sense at all. It looked crazy—insane crazy. I checked to make sure that I had air flowing inside my suit, and no leaks, then cycled the lock and waited while air was pumped out. Watching the pressure gauge over the outer door gave me something to think about—something to *focus* on—that did make sense, something normal, proper. I tried to shut out everything else until I had to think about those other things again.

My sense of balance (like everything else) was a little shaky, like having an inner ear infection. When I stepped outside, I moved very cautiously, keeping one hand against the side of the habitat. I stood there, breathing deeply, trying to get my mind functioning at something approaching normal speed before I shut the outer door. In the fractional gravity of that berg, there was no room for mistakes. And I was going to have to shinny up a rope and try to break into that alien spacecraft. I thought about the difficulty getting the alien's pressure suit off and wondered if I would be able to figure out how to get into his ship. I wasn't certain that I ***wanted*** to.

I took a grip on one of the cables and looked at the ship overhead. I could see the outline of the hatchway thirty meters over my head. It might have been five minutes before I put the second hand on the cable and started pulling myself up the line.

There wasn't enough gravity to make the climb difficult. I always kept one hand tightly on the cable and worked my way up cautiously. I didn't want to build up any speed since I wasn't tethered to the cable by a safety line. If I did get separated from that wire, I would be able to maneuver back with my suit's small cold gas thrusters, but I would have hated to do that, the state my mind was in. I figured that I could clip on a safety line when I got to the top, while I tried to figure out how to open the hatch. Once I had a tether clipped to the cable, I could also take another moment to decide whether or not I really wanted to be able to open that door.

It was almost too easy. The latch was under a sliding panel. Pull the panel down. A large knob with a ridge running across the face was easy to grip. I turned it counterclockwise, the way it would work to open if the ship were human. That didn't work so I tried the other direction. When that also didn't work, I had to pause. Then I pushed in on the knob. When I felt give, I tried turning to the left again. This time the knob rotated and the hatch opened.

I hesitated for several minutes after the door stopped moving. I looked through the hatchway. There were lights on in the airlock, but very dim, bluish in color. I had my helmet lights on though, so I could see without difficulty. The airlock was barely large enough to squeeze into. That was similar to the design of our candles. Anything bigger than the minimum acceptable would be a luxury, deadweight.

I took a deep breath, used that as the excuse for extending my hesita-

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tion. Finally, though, I did pull myself through the hatchway into the airlock, then cycled through into the interior of the alien ship.

There was no way I could know what I might be looking for. The one thing I was almost certain of finding was in a bunk at the rear of the cabin—a headless body, strapped in place. The bed covering was stained with the same rust-color that had been on the tunic of the other alien. I had been prepared for finding a body, so I didn't have the same gag reaction as before. I sucked in a deep breath, held it until I was certain that there would be no flood of nausea, then went to investigate.

With its head in place, the body might have massed sixty kilograms. The undulating surface of the alien heads was continued over the entire body. The effect was still disturbing, almost as if the entire body were covered with large pustules the same color as the skin. The hands had four digits, two opposed to two, all about the same size with one less joint per than human fingers. There were no nails or claws, but the ends of the digits were almost as rough as the gripping surfaces of pliers or wrenches. The feet *were* very like horse hooves.

Despite my revulsion, I investigated that headless body very closely, and I was recording what I saw. There are two camera lenses in my helmet, one at each side, giving true three-dimensional video. This might be the only opportunity we, mankind, got for this sort of observation.

I removed the alien's clothes—tunic and trousers, no underwear. Not having the equivalent of *Gray's Anatomy* for this species, I could only make guesses about what I saw, but if the alien anatomy was anything like human, I was looking at a female . . . judging from the lower plumbing. There were no apparent breasts or nipples, nothing that I could point to and guess that it might serve the same function.

After I had turned the body over and given the cameras a chance to record everything—including a shot directly over the neck—I started looking around the rest of the cabin. There was only one room, not two like in my candle. The control panels didn't look like ours, but there were screens, gauges, and controls. I couldn't read the legends or calibrations. The interior of the cabin did show considerable damage. There were panels that had been deformed by whatever had hit the ship, controls that had been popped out of place. There was considerable loose debris, and one chunk of twisted metal about four kilos in mass showed the same sort of stains, the stuff we assumed was alien blood.

There were no books of instructions, no alien-to-human dictionaries, nothing that I could make any sense of other than in a general fashion.

I spent about forty-five minutes searching without learning anything that might help us help the alien lying on the floor of the habitat. The one left in the ship was beyond help. Nor had I learned anything that might tell us where the aliens had come from, or why one had decapitated the other,

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sewed the head to his own chest, and come into our shipwreck station to pass out. I didn't know if the head was a trophy, or just some bizarre memorial rite.

I passed along what I was seeing. Angie gave me updates on what was happening inside the station. The alien seemed to respond to pure oxygen. His color got darker, he started to breathe more freely on his own, and after more than thirty minutes he started to show a little movement in his fingers and hands. There was no change apparent in the condition of the second head.

"I'm coming back," I announced finally. "I'm sure as hell not accomplishing anything here."

I made the trip back down the mooring line more quickly than I had made the trip up. I hurried into the airlock, closed the outer door, and started the pumps to put air into the lock. With my eyes closed I waited for the pressure to equalize. I did my best not to think about anything but what was happening right there in the airlock. I didn't want to think about the other stuff. There were no answers there, nothing but aggravation, questions we could hardly hope to understand.

Angie looked up when I stepped out of the airlock. She had removed her helmet and pressure suit. There was no obvious threat from the alien, unless he carried microbes that could infect us. It wasn't until later that I worried about that. It was too late for us, if there was. But the year or so we would spend on the wick heading for home would be a generous incubation period. If there was contamination that might not show in that time, everyone in the Solar System could be in big trouble.

"Any change?" I asked after I took my helmet off.

Angie shook her head. "Nothing major. I'm picking up a solid heartbeat, forty beats per minute. Since we don't know what's normal for them, I can't say if that's good or bad. His breathing seems easy, about sixteen per minute."

"We don't know if any of the readings are normal," Clay said. "Anything we do could do more harm than good. Unless he wakes up and finds some way to tell us what he needs, we're blind, deaf, and dumb."

"How about the second head?" I asked.

"That's the same as before," Angie said. "Maybe there's just a hint of darker color to it now. But what about that? Why did the one do that to the other? What's the purpose?"

"I know this sounds crazy, but he may have expected that it would give the other some chance to survive. Extreme first aid, maybe, like putting a tourniquet on an arm or leg to stop an arterial bleeder."

Angie looked at me as if she thought I were crazy for suggesting that. "Either that or he went stark, raving mad."

Then I mentioned the other possibilities that I had thought of, trophy or some kind of rite.

"Anything is, I suppose, possible," Clay said. "Since we know absolutely nothing about these aliens but what we can see."

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I had told them about the headless body and the stained metal. If they had bothered, they could have watched the video. I had done a lot of talking while I was in the alien ship, reporting just about everything I saw and did—everything but some of my thoughts.

"I wish we had someone we could call for help, close enough that it might do some good," Angie said. I guess that we had all wished for that, but wishing would never make it so.

"We are limited," Clay said. "We are doing perhaps the only thing we can now. Either the alien will get better or he will die. It is out of our hands."

That much was obvious. But if this alien died—and that seemed likely—then what? I *thought* that we would have to take the alien ship and the remains of its crew back into the inner Solar System. That was when I started thinking about bacteria and viruses, and anything else small and deadly that the aliens might have carried. The authorities back home would probably not let us dock the alien ship with any of our major facilities. They might not even let any of us get anywhere to pose a hazard to other people for who-knows-how-long. But caution would have to contest with curiosity. They would want to study what we had. I had Barta docked with Ebbie. That would leave Clay the task of pushing the alien ship in. I wasn't sure that he would care for that arrangement, but I wasn't going to suggest switching loads.

"Isn't there anything else we can do?" I asked, rather a forlorn plea in my own ears.

Angie shook her head. Clay didn't waste energy on any reply. It was a stupid question, I guess. And Clay had never been one to waste time on stupidity.

"All we can do is wait," Angie said.

I got out of my pressure suit. It was beginning to feel like a prison. If there was any danger, so be it. I had already exposed myself. By that time I had started to console myself with the thought, the hope, that the alien's physiology and biological environment would be so different that any bugs that might infect them would be unable to infect us. That seemed like a safe bet at a time when I didn't have the option of withdrawing my wager. I was also counting on the guess that the alien spacefarers would be as nearly free of contagious microbes as human space jockeys normally are. We're flushed regularly, when we return from a deep tour and before we go out on the next one. When you might be more than a year from any sophisticated medical help, you take *every* precaution.

Even Clay eventually got out of his suit. Then he ate a meal. He sat as far from the alien as possible and worked through a full ration pack. I joined him. Angie stayed by the alien, hardly ever looking away from him, as if she thought she might keep him alive by the force of her stare, and will.

"We'll never be able to *talk* with him," Clay said after he finished eating. "Not in the time we might have. A language with totally alien foundations, with no points of reference in common. No Rosetta Stone."

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"No what?" I asked. He explained the reference.

"If he recovers enough, we'll find a way to communicate," I said. "We can find the points of reference. Hell, Reid, we must be in the same business. Orbital mechanics, astrophysics, they'll be the same. We can start from the math. We can point and each say our name for whatever it is we're pointing at. We can draw pictures, diagrams, charts. One way or another, we can establish basic communications."

"Just so he can tell us what to do to help him," Angie said. "If he ever regains consciousness."

"As long as he can tell us why he took that second head and sewed it on," I said, half under my breath.

Nine hours later, Clay was sitting on a bench, his back against the wall. He had been dozing for the past three hours. I was on the floor in the opposite corner. I guess I'd been slipping in and out for nearly as long as Clay. Even Angie's attention had flagged. She remained sitting next to the alien, but her head had drooped forward—several times. None of us had done much talking in five or six hours. There was nothing intelligent left to say.

When I was alert enough to think, it was things like, *I wish he'd make up his mind one way or the other,* and, *Get it over with; die or wake up.* How much longer were we going to have to wait? Could we just load the alien on one of the ships, dock Clay's candle to the alien vessel, and start for home? Waiting for the alien to decide to live or die was frustrating. At one point I even considered slapping his face to see if it would provoke any reaction. Then I considered suggesting that Angie do it, mostly to save me the bother of getting up and walking over to them. In the end I just kept my mouth shut.

Then I heard a scraping noise, something different, and looked at the alien. He had pulled up his right leg. The knee was twenty centimeters off of the floor. The movement had also caught the attention of Angie and Clay. Reid leaned forward, staring. Angie went into a flurry of activity, turning to look at the elevated knee, then checking the alien's vital signs.

When Angie gasped, I guessed that the alien had opened his eyes. I was right. I got up on one knee so that I could move in a hurry if I had to, if the alien somehow threatened Angie. Yes, that sounds ridiculous, but we had no idea what to expect.

"We're doing what we can," Angie said, leaning closer to the alien's original head. "It isn't easy. We don't know what to do." Maybe she thought that her words would get through by telepathy. She spent several minutes talking, telling him where he was, who we were, and so forth.

Wasted air, I thought, but I kept my mouth shut. I didn't have any more intelligent ideas to offer. Hell, maybe he *would* turn out to be telepathic. Who was I to say?

I stood. That way I could see for myself that the alien's eyes were open—the eyes in his proper head. Clay stayed put. He was bent forward, elbows resting on his knees, staring.

Angie kept talking, making what I'm sure she considered to be soothing

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sounds—if only the alien interpreted them the same way. Maybe her nonstop chatting was nerves more than anything else. If it had been me, I would have left a little silence here and there to see if the alien would respond.

It must have been ten minutes before Angie gave the alien a chance to answer. She shut up abruptly, in the middle of a sentence. For a minute or so there was absolute silence. I could hear the sound of my own breathing, but nothing more.

The alien made a series of weak, guttural sounds. I was willing to concede, as a first hypothesis, that he was speaking. But he might have been choking, or trying to clear his throat. Call it six or seven words, a dozen syllables . . . assuming it was speech. Whatever it was, it was still unintelligible.

Angie looked at me. "How do we start?" she asked, overlooking the many minutes of chatter she had already inflicted on the alien, and on us.

I shrugged and shook my head. "I can't think of anything better than what you've been doing."

The alien turned his head, enough to see me. He made another short series of sounds.

"I wish I understood you, fella," I said—more practice in the fine art of understatement. I pointed at Angie. "She's doing everything we can think of to help."

He looked at her again.

"If only you could tell us what to do," Angie said to him.

"Point at the other head," I suggested.

She did that. Then she shrugged and asked, "Why?"

The alien looked at his extra head. His eyes closed after a few seconds, but did not stay closed for long. He seemed to suck in a deep breath—the oxygen mask was no longer over his mouth and nostrils—then made more sounds.

I picked up my helmet to use the radio. "Ebbie, have you been monitoring this?" The alien watched what I was doing.

"Yes, Tim. I believe that it is speech, but I do not have enough data to guess at meaning or structure."

That stopped me for about three seconds. "I didn't know you had routines for anything like that," I said.

"I have very extensive language routines. I do not have all human languages in memory, and there was always the chance for something like this. If there were some way to link me directly with the alien's computer, assuming that it is functional, it might be possible for us to develop mutual communications."

I felt like kicking myself, or inviting Clay to do it. "If we can link Ebbie to the alien ship's computer, she might be able to begin some sort of translation," I said.

"Of course!" Clay slapped himself on the forehead.

Angie looked first at me, then at Clay. Her expression was almost blank.

"I never thought to ask Ebbie if she had any translation routines," I said. It had never occurred to me. No one in my lifetime had given much serious credibility to the chance of finding

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aliens. Yet some dreamer had put that sort of programming into a candle computer, just in case. It would have been a lot more convenient if someone had told us about it.

Clay got up long enough to fetch the alien's helmet, the one that had been on the head sitting on his shoulders, and handed it to Angie. She took it, pointed inside, then pointed in the general direction of the alien's ship. The she talked into the helmet before moving it toward the alien.

He gestured toward the helmet but could not lift his hand enough to reach it. Angie held the opening near his mouth and he did more talking, not as loud as when he was talking to us.

I did more talking into my helmet, then took it over. Angie and I set the helmets together on the floor, open end to open end. "OK, Ebbie, we've got you set up, I think," I said. "Let us know over the habitat radio if you get anything."

I had no idea how long Ebbie might need to get anything we could use—if she would ever be able to. Ebbie has a lot of computing power. All of the candle ships do. They need it for a lot of things, not the least of which is the ability to keep a pilot company for two years or more at a time.

"You want to try to feed him?" I asked Angie. "Fix up some broth, maybe a ration pack, see if there's anything he can eat?"

"We might poison him!"

"Water, at least," I suggested. "His chemistry must be able to handle that."

Angie hesitated, then nodded. I got a squeeze bottle and gave it to her. Angie squeezed a little water into her own mouth first, holding the spout far enough away so that the alien would be able to see that it was a clear fluid.

"Water," Angie said. She held the tube near the alien's mouth. He opened it a little and she gave a very gentle squeeze, just a few drops.

He obviously recognized the taste. He said something, perhaps a single word, then held his mouth open again. Angie gave him a little healthier amount this time, and then more, letting him set the pace. She stopped only when he indicated that he had had enough. He said several more words, softly, and closed his eyes for a moment.

"We've started communicating," I said, looking at Clay.

Several minutes passed before we heard from Ebbie. "This is going to be difficult," she said. "Their computer suffered damage. I can't diagnose how much. We are starting from utter basics, scientific truths, mathematical constants, and so forth. With only the audio link you have provided, it will take hours to get to anything that you might be able to use to converse with the alien. If his computer has the necessary knowledge."

"Do what you can, Ebbie," I said. "If you can get to the point where the two of you can understand each other past the numbers, we can try communicating with the alien, let you and the other computer do the translating."

"That is what I am working toward, Tim. We are working together even now." Well, I knew that Ebbie could

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operate several different tasks at once—dozens of them.

The alien seemed to be a little stronger after taking his sips of water. Ten or fifteen minutes later, he gestured for another drink, and Angie gave it to him. He could lift an arm now. The first thing he did was reach up and touch the face of the head sewn to his chest. He appeared to caress its cheek. While he did, he talked softly, too softly for me to have made out the words even if I could have understood them.

"If we prop him up a little, maybe he could take some food," I said, watching the alien pay attention to the extra head. I had to talk, had to say something, *anything*. Watching that macabre monologue was making my stomach feel queasy again.

"I still don't think that we should risk that," Angie said.

"A little broth, something more than just water," I said. "He can't do much if we can't get something more into him."

"How about some of his own food?" Clay suggested. "Did you see anything in the ship that might be food?"

"I didn't even think about food," I admitted.

"I'll go have a look, bring back anything that looks even remotely as if it might be food." I was surprised to hear Clay volunteer. Maybe he just wanted a look at the ship's interior. Or maybe, just to give him the benefit of the doubt, he was actually caught up in trying to help a fellow pilot.

"That would be safer than risking any of our food on him," Angie said.

So Clay worked his way back into his pressure suit and left the habitat. He was actually moving rapidly, to do something for someone else. Maybe all of the waiting had something to do with his speed. Or maybe there was a touch more humanity to Clayton Reid than I had ever given him credit for.

"Maybe it's time to start thinking about propping him up a little," I told Angie. "Eating might be easier for him, the way it is for us in gravity."

"But what about...?" She didn't point at the spare head, but her eyes moved that way. "If we put him more upright, won't that put extra pressure on those stitches?"

"He came in walking," I reminded her.

"And passed out. Either way, we're still guessing," Angie said. "Why don't we wait until we see if Clay finds anything?"

I couldn't argue with that. Postponing tricky decisions was probably still the best choice.

"He does seem to be a little stronger now," Angie said.

The alien was moving, but never much at once. He seemed to be trying to make himself more comfortable, in very tiny increments. That extra head had to be putting a strain on him, even in the very light gravity field we were in.

It was about then that I noticed that the alien was almost constantly staring into that extra face. It was more than that brief monologue and touching I had noticed before. I found myself wishing that I could read his expression, his emotions. If he had any. I

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mentioned the staring to Angie.

"I noticed before," she said. "As soon as he had a little energy, I think. It's spooky."

"It was spooky from the beginning. It's so . . . un-human."

That almost provoked a laugh from Angie, or a retch. I wasn't certain which. "No kidding," she said after she had a chance to recover from that initial impulse.

"Have you had the feeling that this must be a really weird dream?" I asked. "That none of it is really happening?"

"Don't go metaphysical on me, Tim. It doesn't suit you, and my head hurts without trying to parse questions like that."

The alien said something. Angie turned her attention back to him. He repeated, as closely as I could make out the sounds, what he had said before. He added a couple of weak gestures not enough to help us decipher the words.

"I don't know what you said," Angie told him, shrugging in a minimal gesture of her own. "We're trying to find food for you. Maybe that will help. Anything more will have to wait until our computers find a way to translate for us. If they do."

One sound from the alien. Maybe "yes," "no," or maybe just a conversational place holder, an "ah" or "er."

We had to wait another twenty minutes before Clay returned with a collection of things he had found in the alien's ship. He gave the packages to Angie, let her display them to her patient while he stripped out of his pressure suit again.

"That place was a mess," Clay said to me, speaking as if he didn't want the alien to overhear. "It's remarkable that he survived."

"That survival is still in doubt," I pointed out.

Clay looked at the alien. He had apparently chosen one of the packages. Food. Angie helped him eat. The stuff was some sort of thick paste, not much different in color than the alien's skin—it didn't look very appetizing to me.

"Perhaps we should have all of the computers working together on translation," Clay said.

"I asked Ebbie if that would help," I told him. "She didn't think that it would. She said that all of the translation programs were essentially identical and that since we only have one link to the alien's computer, there would be no benefit."

"Even if we can nurse this creature back to health, I don't see any way that we could help him repair his ship so that he could go back to his own kind," Clay said.

I didn't answer right away. I was having difficulty getting used to this sudden garrulousness from Clay. It was the clearest sign that the uniqueness of our position was affecting him.

"I know," I said finally. "What I said before still holds. I think you'll have to give him a tow to Mars. I've already got Barta docked to Ebbie."

He nodded slowly. "I suppose you're right. The question in my mind is whether the cabin of his ship is safe enough for him to travel in, or if he will have to ride with me." It was

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clear that he would prefer to have the alien in the other ship, and I can't say that I blame Clay for that.

"He's going to need attention for some time, I think, even if his ship were habitable—and I doubt that it is," I said. "But there are some benefits."

He gave me one more very slow nod. "Trade-offs," he said, almost under his breath.

"As long as he stays healthy, you should have a year to converse with him, once the translation program is set up." Ebbie would transfer everything to the other candles, and send it on to Mars in a burst transmission so that the experts there could continue working on it while they waited for us.

It occurred to me that having a year alone with the alien would give Clay the lion's share of the attention when we got home. Under the circumstances, he would probably deserve it. He would be "the" expert on the aliens. But I never considered offering to let him ferry Angie and Barta while I took the alien and his ship. All of that attention: if I enjoyed that sort of thing, I wouldn't have been an Oort miner in the first place.

The alien took a long time with his eating. I guess it was work. Clay's talkativeness wore itself out. We watched the meal. When it was over, the alien gave what sounded like a sigh of satisfaction and closed his eyes for a protracted moment. When he opened them again, he spoke. I doubt that it was anything so prosaic as, "My compliments to the chef."

Food did seem to improve the alien's condition, even before he had time to digest it. He appeared to be stronger. His gestures when he talked were—if not quick—not as slow as before, and slightly more animated. He did seem more inclined to talk after he finished eating. At times he rambled on for two or three minutes before falling silent.

At one point, Angie offered him the water bottle again and he took it. She pointed to the flask and said, "Water." He took his drink and said something that sounded like it was all G's and Z's with maybe a Y or U thrown in the middle. Angie tried to repeat the word, with a notable lack of success, then said, "Water," again. The alien tried to echo that word, with as little success as she had had with his word.

"Come on, Ebbie," I said under my breath. "Let's get that translation program working."

The alien was cradling the extra head in both hands. At times he talked to it while he stroked one cheek or the other. Even worse—from my point of view—some color seemed to be returning to the head sticking out of the alien's chest. That made the hair stand on my arms. If felt as if the skin were crawling up and down my spine. If the second head talked back, I wasn't sure what I would do. I wouldn't have ruled out a complete panic attack. It might have been too much for any human mind to handle. It would have been more than any human should *have* to handle.

But it didn't happen. Thankfully.

Angie had finally felt the need for sleep. While she dozed on one of the

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benches, I sat next to the alien and made certain that he had water when he wanted it. By that time we could recognize his word for water even if we couldn't reproduce it. He also seemed to doze off and on. When he was ready for a second meal, he was able to feed himself. His condition was clearly improving. I suspected that if it hadn't been for the second head, he might have been nearly back to normal—whatever normal might have been for him.

Angie slept for two hours. Clay dozed for a time as well, propped up in his corner. I was also tired, but I did my best to stay awake, coming alert each time my head dropped forward. I tried a little water myself, hoping that would help keep me from falling asleep.

Despite everything, I almost did drop off. The air in the room felt heavy—hot and stagnant despite blowers and conditioners. Neither Angie nor I had bothered to turn the thermostat back down. I became aware of the low background hum of the machinery that kept everything operating. It was a lullaby. The alien had closed his eyes and seemed to be sleeping as well after his second meal.

A string of words in the alien language coming from the radio speaker almost turned me inside out. I must have been on the verge of falling asleep. The shock started my heart pounding before I realized that it was Ebbie's voice uttering the alien sounds. Clearly, she had made *some* progress.

Angie and Clay had also come awake, and the alien had his eyes open when I looked at him. He replied. Ebbie said something else in his language. Then she switched to English.

"It has not been easy," she informed us. "There are still vast gaps in what I have been able to learn. After we worked through physical and mathematical constants, we compared operating similarities, finding words for common functions and features. The leap from there to conversation was most difficult, and there are a great many words we cannot yet bridge, but I believe that there is enough for a beginning. We will monitor conversation in the habitat, and do such translating as we can while we continue our direct work. In time, we should be able to fill in many of the gaps that exist now."

"Ebbie, this is Angie McBroom. Can you ask him what else we can do to help his recovery?"

There were several exchanges between her and the alien in his language. I suspect that the alien's computer got into the act as well, but I can't be certain of that. The discussion went on for a couple of minutes before Ebbie switched back to English.

"You are probably doing all that is possible," she said. "I am interpolating here, but I think that what he really needs most is a blood transfusion, and human blood would almost certainly not be appropriate."

"What about a saline solution?" Angie asked, something I wouldn't have thought of in a million years. Intravenous saline packets would be part of the shipwreck station's medical stores. "Would that help?"

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"Let me investigate," Ebbie said before she switched back to the alien language. This time the conversation went on for a considerable time, and from the gaps in the talk between Ebbie and the alien I was certain that there were also contributions from his computer.

"It probably can't hurt and might help," Ebbie said. "The suggestion has been made that the appropriate place to insert the fluid would be near where his mate's head has been attached to the chest, just above, where the sutures are closest together."

"His *mate's* head?" I said, rather loud.

"Yes, the head," Angie said. "What is that all about?"

"An extreme measure to preserve the life of this one's mate," Ebbie said. "I queried the other computer at great length on this. Apparently—and I am once again interpolating through language gaps—it was the only possible way to preserve that life. The head was removed. This one made a number of cuts on his own chest and attached the head there, over his heart. Preserving the mate's life is necessary to preserving the life of this one. These beings pair-bond so deeply that if one mate dies the other does also, without exception."

"How does it work?" Angie asked. "How can grafting the head on do anything?"

"The other body appeared to be too badly damaged for repair, even without the decapitation," I added.

"I cannot be certain of the details," Ebbie said. "Some of what I have deduced may be total guesswork, and is therefore subject to a rather large margin of error. I think that once the alien returns to his own people their medical specialists will be able to grow a new body for the head. That is the only sense I can make of it."

"How long can he, they, continue like this?" Angie asked. "We're not going to be able to repair their ship here. We'll have to take them back to Mars. Can they survive for however many years it takes to get them home like that?"

"I do not know."

"Where do they come from?" Clay asked.

"The second planet of Alpha Centauri A," Ebbie said quickly. "We established that quite early in our session."

"We've never received any replies from our radio transmissions directed there," Clay said. "And I am unaware that we ever heard anything from that location before we quit trying."

"We did not go into any of that," Ebbie said. "I doubt that it would do much good. The alien's computer does not seem to have any great store of historical data in storage, at least not in those portions that have survived. As I said before, she did suffer considerable damage."

"At least now we'll be able to talk to them in their own language," Angie said. She had moved away from the alien and was rummaging in the medical supply cupboard. When she had the IV packet she was looking for, she went back and knelt beside the alien. "Any suggestions on how I start this IV?" she asked. "How do I find a vein?"

Ebbie asked the alien. He tapped his chest a finger's width to the left of the

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centerline. He talked at the same time.

"The main vein there is about a centimeter deep, I believe, from the low spot in his skin," Ebbie said. "As close to the head of his mate as possible."

There wasn't enough gravity on the berg to count on that alone for an intravenous drip. The IV pack included a small pump. The entire unit was designed to adhere to the arm of a human. The needle would extend itself from the bottom of the pack. It would seek a vein in a human. We were about to find out if it could manage the same feat for this alien.

Angie hesitated for a long time, both before she set the pack in place under the chin of the second head, and before she activated it. "I'm afraid I might kill him," she said. Ebbie did not translate that.

The alien must have had doubts of his own. He stiffened up as the needle punctured his skin. For a moment he remained almost rigid, holding his breath. His face paled, but returned to what we took as normal shortly. Angie kept track of his heart rate and respiration. She watched his eyes. We all waited.

After ten minutes, we started to think that at least we hadn't killed him with the IV. It was too soon to look for any improvement, but at least he showed no signs of getting worse. He had not gone into shock or anything like that.

"Ebbie, tell him that we won't be able to repair his ship here, that it's too badly damaged. Tell him that we'll take him and his ship to our homeworld. I'm sure that we can either repair his ship there or provide him with a replacement." Wouldn't the cost of *that* raise a storm! I waited for Ebbie to pass that much information along. The alien spoke at some length in reply, with a couple of sidebars while he and Ebbie tried to decide on a translation for something or other.

"As near as I can make it out," Ebbie said when they were finally done, "he offers thanks and says that he did not think that it would be possible to repair his ship here, that he knows that it needs major repairs. He asked how long it would take to get to our homeworld, and how far that was from his home."

"Tell him," I said.

I *think* that I saw something that might have been despair on the alien's face once Ebbie got that information across to him. She spoke for nearly a minute. He replied slowly.

"He is not certain whether or not they can survive that long. Apparently it will far exceed the longest time ever known for this sort of arrangement. I had to go to some length to get the time and distance involved in terms he could understand. He has no concept of our measures of those. It seems, though, that his ship is not markedly faster than I am. With the time it will take us to get him to Mars, and the time his return from there to his homeworld will take, they will have to remain as they are for more than ten Earth years." Plus whatever time it would take for our people to repair his ship and decide to let him go. There would be arguments over that. Some of our folks would want to keep him around to study, whatever that might do to him.

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I looked at the alien. I didn't have to be able to read his expressions or body language to feel something of his anguish. His desperation. I don't know that I would have had the heart to try what he was going to have to attempt.

"Ask him," I said. "Ask him if he will try." I don't know why, but it was suddenly extremely important to me that the alien not give up, that the desperation that had led him to such extreme means of keeping his mate alive would sustain him. I listened intently to what Ebbie said, and to what he replied, even though I couldn't begin to make sense of the alien sounds.

"He will try," Ebbie reported. "He says that he has no alternative."

Now, all of us have to wait, the entire human race. We got our Centauran to Mars alive. His ship was repaired and we saw him off on his way home. He's not even halfway there yet.

He is still alive, and apparently his mate's head remains . . . *vital*, I guess is the word. That was the last information we had from him. We're in contact, spottily now that he's so far out. It takes messages eighteen months in each direction, and that figure is constantly increasing.

We have also sent messages toward his homeworld—hundreds of thousands of words. Some of that is in human languages, mostly English. The rest is in his language. We can't even start looking for a reply for more than six years. We're still trapped by the speed of light. But people do a lot of talking about that reply, wondering what it might contain.

Angie, Clay, and I did the best we could for the alien. So, despite some opposition, did everyone else who came in contact with him or his ship. The Oort Miners Guild made enough noise to make certain that things were done right. Maybe our first contact with an alien species was unplanned, unexpected, but maybe it went all the better for that. ■

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Michael A.G. Michaud

ORGANIZING OURSELVES FOR CONTACT

Suppose a SETI group does get a message. Then what?

Let's imagine that a radio astronomer is using a powerful radio telescope to systematically survey the sky for signals that might be evidence of an extraterrestrial civilization (at least four such searches have been under way for years). Decades of effort come to fruition when she finds a signal that does not appear to be either from an astronomical object or from a human-made technology.

What should she do? Call the *New York Times*? Send a message back, extending greetings from the Earth?

Until recently, there was no consensus about how we humans should act in this situation. *De facto*, the decision was left up to individuals and their immediate organizations. Now an effort is under way internationally to seek consensus on a preferred human response to the detection of an alien civilization.

First Steps

For decades, science fiction writers have taken the lead in preparing the human species for contact with extraterrestrials. We all carry images in our minds of what extraterrestrial beings may be like, and how they may behave. Most of those images, whether alarming or benign, come from science fiction.

What science fiction writers could not do is to get the human species organized for contact. That activity is properly in the arena of politics and diplomacy. But we have run into a chicken and egg problem. In the absence of convincing evidence of an

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extraterrestrial civilization, governments, politicians, and diplomats have not given sustained attention to what we should do if we detect another intelligent species. This has left the initiative in the hands of non-governmental organizations.

Non-governmental interest in this question began to grow slowly in the 1960s and 1970s. Lawyer Andrew Haley outlined his concept of a universal "Metalaw" for relations among intelligent species in one chapter of his 1965 book *Space Law and Government*. Austrian lawyer Ernst Fasan addressed the same issues in a German-language book in 1970. In December 1972, the author of this *Analog* article, then a professional US diplomat, published the first of series of articles offering a diplomatic perspective on the issue. But there was no detectable official interest in this subject in the world's foreign ministries.

In 1977, the question of extraterrestrial intelligence was raised in the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS). A number of delegations addressed the question, including Austria, Czechoslovakia, and Indonesia, with the latter proposing that the subject be assigned to the Scientific and Technical Subcommittee of the COPUOS. In 1978 the UN General Assembly briefly considered the question and invited interested countries to coordinate their scientific research on extraterrestrial life and to inform the Secretary General of the results of their activities. However, there was little response to this invitation, and the subject has not been raised in the COPUOS since then.

The movement toward a more organized approach accelerated in the 1980s. In March 1985, Professor Alan Goodman of Georgetown University began circulating drafts of a paper titled "Diplomatic Implications of Discovering Extraterrestrial Intelligence," including a proposed international code of conduct in the event of a detection. That code contained four principles: (1) anyone who discovers evidence of extraterrestrial intelligence will publicly report the contact; (2) any response will be formulated by a process of international consultation; (3) visiting extraterrestrials will be regarded as envoys entitled to diplomatic immunity, protection, and aid in the event of accident; (4) in the event that extraterrestrials appear to pose a threat to human health or peace, no nation shall act without first consulting the United Nations Security Council.

At the Congress of the International Astronautical Federation in Stockholm in October 1985, Dr. John Billingham, then Chief of the Extraterrestrial Research Division at the NASA Ames Research Center, proposed that a session at the next Astronautical Congress address the question of international agreements on four points: (1) the need to distribute the details of a discovery to all nations; (2) the establishment of a mechanism to distribute this knowledge; (3) how to determine if a response should be made and who should make the response; (4) how to determine the content of a response. Goodman presented a revised version of his paper

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at the first special session, held during the October 1986 Astronautical Congress in Innsbruck, Austria.

The October 1987 Astronautical Congress in Brighton, England included a similar special session on the formulation of an international protocol for activities following the detection of a signal from extraterrestrial intelligence. As co-chairman of that session, I noticed considerable overlap among the papers that were presented that day. Overnight, I drafted a synthesis of common elements from the various proposals.

The issues associated with handling a detection struck me as being different from the issues associated with sending a communication. I produced two separate drafts, one a proposed agreement on how to handle a detection, the other a proposed agreement on sending a response. These drafts were discussed in Brighton the next day by twenty-one people, including astronomers Jill Tarter, Robert Dixon, Ivan Almar, Peter Boyce, and Jean Heidmann; international space lawyers Ernst Fasan and Bess Reijnen; social scientists Ben Finney, Allen Tough, and Donald Tarter; science fiction writer David Brin; and Louis Friedman of the Planetary Society. We made good progress on the detection agreement, but soon got bogged down in broad moral and philosophical issues related to the draft agreement on communication. It became clear that it would be easier to get consensus on how to handle a detection.

Over the next year, I coordinated the redrafting of the detection agreement under the auspices of the International Academy of Astronautics, revising the text in response to comments received from others. We achieved consensus by the end of 1988. Czech legal scholar Vladimir Kopal, former head of the Outer Space Affairs Division of the United Nations, requested that the proposed agreement be described as a Declaration of Principles, making it voluntary and legally non-binding.*

This Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence was endorsed by the International Academy of Astronautics in April 1989 *(for full text please see p. 58).* Since then, the document also has been endorsed by the International Institute of Space Law, the International Astronautical Federation, the International Astronomical Union, the Committee on Space Research, and Commission J of the Union Radio Scientifique Internationale.

The Declaration is open for signature by any person or organization engaged in the scientific search for extraterrestrial intelligence. In July 1992 the International Academy of Astronautics sent the Declaration to all organizations involved in radio

**Declarations of Principles agreed to by governments, while not legally binding themselves, can become the basis of formal international agreements. The Outer Space Treaty of 1967, which is the primary international agreement in this area, grew out of a Declaration of Principles developed within the United Nations Committee on the Peaceful Uses of Outer Space.*

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searches with a request that they consider endorsing it (most have done so, some have not). Dr. John Billingham, now with the SETI Institute and Chairman of the International Academy of Astronautics SETI Committee, acts as the central coordinating point for adherence to the Declaration.

The Declaration is intended to encourage scientists engaged in the search for extraterrestrial intelligence to follow certain practices in the event of a detection. The central principles were outlined by astronomer Peter Boyce in his 1987 Brighton paper: verify the evidence in cooperation with others, and then tell the world. The Declaration also spells out more technical procedures, including recording the evidence and protecting the appropriate wavelengths from interference. Many of these procedures were developed by astronomer Jill Tarter, chief scientist of NASA's short-lived SETI program and founder of the SETI Institute in Mountain View, California.

The Declaration, sometimes referred to as the First SETI Protocol, also provides that no response to a signal will be sent until appropriate international consultations have taken place. The mechanism for those consultations was left to a future agreement, declaration, or arrangement. That led to the development of the so-called Second SETI Protocol.

Should We Send a Message? What Should It Say? Who Decides?

People associated with the International Academy of Astronautics have continued to work on the issue of sending a message. While most of us have definite personal views on this question, we decided that it would be difficult to achieve consensus in the near term on whether and how to send a message, and on what the contents of that message should be. Instead, we have focused on setting up an international process for making those decisions.

The first formal expression of this approach was in a paper by John Billingham, Jill Tarter, and myself, presented at the October 1990 Astronautical Congress in Dresden, Germany. Titled "A Reply From Earth?" the paper suggested the development of an international agreement or declaration of principles that would establish procedures enabling all humans, through appropriate representatives, to participate in making these decisions. We proposed that the draft be provided to the United Nations for its consideration, through the Committee on the Peaceful Uses of Outer Space. We recognized that an agreement with the potential importance of this one would need to be widely discussed before it was put in final form, through workshops, public debates, media coverage, and other forms of public discourse. However, the process has to begin somewhere. As a starting point, we suggested the following principles:

1. A response to the detection of extraterrestrial intelligence should be on behalf of all Humankind. If Humankind decides to respond, it should do so with one voice, not many.

2. The decision on whether or not to respond should be made by an appropriate body, broadly representa-

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tive of Humankind.

3. The content of a reply should reflect an international consensus.

Members of the Academy's SETI Committee began drafting a "White Paper" on the issue in 1992. After consultations with others, this draft evolved into an International Academy of Astronautics Position Paper titled "A Decision Process for Examining the Possibility of Sending Communications to Extraterrestrial Civilizations." That paper, which was endorsed by the International Institute of Space Law, included a draft Declaration of Principles Concerning the Sending of Communications to Extraterrestrial Intelligence.

In October 1996, the president of the International Academy of Astronautics, Dr. George Mueller (a former senior official of NASA), transmitted this Position Paper to the foreign ministers of nations that are members of the UN Committee on the Peaceful Uses of Outer Space (COPUOS). Mueller's letter asked each foreign minister to consider the possibility that his government might introduce the draft Declaration of Principles into the COPUOS. As of this writing, one government has indicated that it might be willing to introduce a draft Declaration of Principles into the United Nations, and another has shown interest in pursuing the matter through the European Space Agency.

Principles for Communication

The draft Declaration of Principles begins by stating that international consultations should be initiated to consider the question of sending communications to extraterrestrial civilizations (for full text please see p. 61) Consultations on whether a message should be sent should take place within the COPUOS, with input from other qualified organizations and groups. The purpose of these consultations would be to develop recommendations reflecting a consensus. If these principles were adopted, the United Nations General Assembly would consider making the decision on whether or not to send a message—and on the content of that message—based on recommendations from the COPUOS.

The draft Declaration then spells out principles that date back to the second Brighton draft of 1987. If a decision is made to send a message, it should be sent on behalf of all Humankind, rather than from individual nations. The content of the message should reflect a careful concern for the broad interests and well-being of Humanity. No communication to extraterrestrial intelligence should be sent until appropriate international consultations have taken place. The draft Declaration adds a principle: consideration should be given to a long-term institutional framework for communications with extraterrestrial intelligence.

All of those involved in this process recognize that they can not dictate the outcome. If the proposed Declaration of Principles is introduced into the United Nations for discussion, its language almost certainly will be changed.

But that is the point. The draft Declaration is a means to inspire discussion and the development of a con-

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sensus reflecting the views of all nations. It is not an effort to legislate the outcome, but a means of getting governments and other people involved in public policy to think about the issue in advance of a detection.

Governments won't respond thoughtfully to a detection unless they have been prodded intellectually before it happens. As the timing of a confirmed detection is unpredictable, that prodding has to be fairly continuous; governments have short memories. Putting the question on the agenda of the United Nations would require governments to address the issue.

What Next?

The fact that no government has yet introduced the draft into the UN is not fatal. The non-governmental effort to start the process leading toward consensus already has been under way for more than ten years. This is a long-term initiative, and the timing of a final outcome is unpredictable.

Meanwhile, interest in this subject is spreading, notably among people younger than the original drafters. Their enthusiasm and new ideas will keep the effort going.

Ultimately, intergovernmental action may depend on an actual detection of extraterrestrial intelligence. If that happens, officials and legislators will draw on their memories, consultation with "experts," or instant research to look for the most useful way to handle decisions related to detection and communication. The main reference points will be the Declarations of Principles.

OBJECTIONS

Inevitably, people have raised questions about the existing Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence, and the proposed Declaration of Principles Concerning the Sending of Communications to Extraterrestrial Intelligence.

Objection One: You're Legislating My Behavior

Some of the press reporting on the existing Declaration has presented a very distorted picture, implying that it is an international agreement imposing weighty procedures on radio astronomers and legislating the behavior of private organizations engaged in SETI. In fact, the Declaration is not law or regulation in any sense. It is not an international agreement, because the parties to it are not governments. The Declaration is not even a protocol in the technical diplomatic sense of that term. Adherence to the Declaration is entirely voluntary. It is not legislation, but a first step in the development of consensus.

Some reporting has implied that, under the Declaration, SETI researchers would be required to notify international organizations before notifying the general public. Any close reading of the Declaration would show this to be untrue. The notification of international organizations is a courtesy intended to encourage their interest and support. The Declaration does require that the discoverer promptly inform other observers or research organizations that are parties to the Declaration so that those

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other parties may seek to confirm the discovery, in advance of a public announcement. This procedure is intended to give researchers an incentive to become parties to the Declaration.

Objection Two: The United Nations is Telling Us What To Do

Senator Jesse Helms, in a 1996 article in the influential journal *Foreign Affairs,* described the existing Declaration as a product of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS). It isn't. The COPUOS has not even discussed the Declaration. Senator Helms appears to have been misled by inaccurate press reporting.

Objection Three: The Declaration Only Applies To Radio Signals

The existing Declaration implicitly rests on the classic radio astronomy paradigm of detecting a signal from a very remote source. Some critics have asked if it would be applicable in other scenarios.

Allen Tough has raised the question of whether a separate "protocol" is necessary to handle the possible detection of an alien probe in our solar system (probably not, he concluded). In this context, Tough raised questions about the Declaration's injunction against sending a communication without prior international consultation, suggesting that the probe might lose interest and move on if we didn't respond promptly. But sending a communication to an alien probe would be effectively the same as sending a message to its home civilization, as the probe almost certainly would be designed to relay the signals it receives. Therefore, most of us believe, the Declaration's principles should apply.

One participant in the ALLSETI e-mail network suggested that another "protocol" be developed to address the possibility of direct contact, as in an alien landing on the Earth. This proposal has not found much support in the SETI community.

Tough, raising the possibility that ETI may already be living among us on the Earth, also has launched an initiative to post a welcome message on the Internet. This is a good example of the interesting ideas that have been stimulated by the original Declaration.

Objection Four: We Should Take The Initiative

Donald Tarter and others have advocated what he calls "active SETI," broadcasting messages to provoke a response from another civilization. In effect, this is what Frank Drake and colleagues did in 1974 when they used the 1,000-foot dish at Arecibo to send a powerful signal to the globular star cluster known as M13. While all of us respect Dr. Drake as a SETI pioneer, I and others questioned what right a small, self-appointed group had to speak for the entire human species.

Most of those involved in drafting the Declaration believe that we should apply the same principle to an "active SETI" signal that we would apply to a response to a detection: don't send a message without prior international consultation. Tarter's proposed strategy could be a test case of the in-

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ternational consultative process. But the arguments, pro and con, should be heard before we start sending messages.

Objection Five: People Will Send Messages Anyway

Some participants in this debate argue that no international agreement could prevent the sending of separate messages by different nations or groups. In effect, they say that the Earth will speak with many voices, not one. Anthropologist Michael Ashkenazi even suggested that it would be desirable for human diversity to be reflected through separate communications to ETI.

At the very least, this would invite confusion at the receiving end. It also could invite manipulation. And it would lose the potential benefits of consensus-building among humans through the development of an agreed message.

To send separate messages, private organizations or groups would need powerful transmitters capable of sending signals to a civilization that may be very remote. (Local radio stations and ham operators are not the issue.) In many countries, such major transmitters are under the direct control of the government. In all others, they are subject to governmental regulation. Governments are not helpless in this matter unless they choose to be.

Of course, some of the world's less responsible governments could choose to send their own communications. Muammar Qaddafi and Kim Jong-Il could represent us to the Cosmos. But that is exactly the point of initiating discussion on the proposed Declaration of Principles Concerning the Sending of Communications to Extraterrestrial Intelligence: to build a consensus on principles that all nations would observe.

Objection Six: They Already Know We're Here

For many years, some scientists have argued that there is no point in restraining ourselves by not sending messages to ETI because our radio, television, and radar transmitters already have given us away. Our earthly emissions have been leaking into the Cosmos for most of this century.

In fact, our routine radio and television signals are relatively weak in the context of interstellar distances. Our most powerful signals, from massive radars, may be observable from farther away. But they are mindless. They contain no information other than their own physical parameters. Above all, they do not convey intent.

This is where the international consultative process would have the greatest meaning. By requiring the development of consensus, it would force the world's nations to examine their shared interests and their shared values, and to decide how Humankind should present itself to others. Building consensus on the Message would strengthen our identity as a species. It would help us to define who we are. And we would have to consider our intent toward other intelligent species.

The starting points for the long debate have now been established. It is time for others to get involved. ■

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Text of Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence

We, the institutions and individuals participating in the search for extraterrestrial intelligence,

Recognizing that the search for extraterrestrial intelligence is an integral part of space exploration and is being undertaken for peaceful purposes and for the common interest of all mankind,

Inspired by the profound significance for mankind of detecting evidence of extraterrestrial intelligence, even though the probability of detection may be low,

Recalling the Treaty on Principles Governing the Activities of States in the Exploration and use of Outer Space, Including the Moon and Other Celestial Bodies, which commits States parties to that treaty "to inform the Secretary General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results" of their space exploration activities (Article XI),

Recognizing that any initial detection may be incomplete or ambiguous and thus require careful examination as well as confirmation, and that it is essential to maintain the highest standards of scientific responsibility and credibility,

Agree to observe the following principles for disseminating information about the detection of extraterrestrial intelligence:

1. Any individual, public or private research institution, or governmental agency that believes it has detected a signal or other evidence of extraterrestrial intelligence (the discoverer) should seek to verify that the most plausible explanation for the evidence is the existence of extraterrestrial intelligence rather than some other natural phenomenon or anthropogenic phenomenon before making any public announcement. If the evidence cannot be confirmed as indicating the existence of extraterrestrial intelligence, the discoverer may disseminate the information as appropriate to the discovery of any unknown phenomenon.

2. Prior to making a public announcement that evidence of extraterrestrial intelligence has been detected, the discoverer should promptly inform all other observers or research organizations that are parties to this declaration, so that those other parties may seek to confirm the discovery by independent observations at other sites and so that a network can be established to enable continuous monitoring of the signal or phenomenon. Parties to this declaration should not make any public announcement of this information until it is determined whether this information is or is not credible evidence of the existence of extraterrestrial intelligence. The discoverer should inform his/her

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or its national authorities.

3. After concluding that the discovery appears to be credible evidence of extraterrestrial intelligence, and after informing other parties to this declaration, the discoverer should inform observers throughout the world through the Central Bureau for Astronomical Telegrams of the International Astronomical Union, and should inform the Secretary General of the United Nations in accordance with Article XI of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and other Celestial Bodies. Because of their demonstrated interest in and expertise concerning the question of the existence of extraterrestrial intelligence, the discoverer should simultaneously inform the following international institutions of the discovery and should provide them with all pertinent data and recorded information concerning the evidence: the International Telecommunication Union, the Committee on Space Research of the International Council of Scientific Unions, the International Astronautical Federation, the International Academy of Astronautics, the International Institute of Space Law, Commission 51 of the International Astronomical Union, and Commission J of the International Radio Science Union.

4. A confirmed detection of extraterrestrial intelligence should be disseminated promptly, openly, and widely through scientific channels and public media, observing the procedures in this declaration. The discoverer should have the privilege of making the first public announcement.

5. All data necessary for confirmation of detection should be made available to the international scientific community through publications, meetings, conferences, and other appropriate means.

6. The discovery should be confirmed and monitored and any data bearing on the evidence of extraterrestrial intelligence should be recorded and stored permanently to the greatest extent feasible and practicable, in a form that will make it available for further analysis and interpretation. These recordings should be made available to the international institutions listed above and to members of the scientific community for further objective analysis and interpretation.

7. If the evidence of the detection is in the form of electromagnetic signals, the parties to this Declaration should seek international agreement to protect the appropriate frequencies by exercising procedures available through the International Telecommunication Union. Immediate notice should be sent to the Secretary General of the ITU in Geneva, who may include a request to minimize transmissions on the relevant frequencies in the Weekly Circular. The Secretariat, in conjunction with advice of the Union's Administrative Council, should explore the feasibility and utility of convening an Extraordinary Administrative Radio Conference to deal with the matter, subject to the opinions of the member Administrations of the ITU.

8. No response to a signal or other evidence of extraterrestrial intelligence should be sent until appropriate international consultations have taken place. The

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procedures for such consultations will be the subject of a separate agreement, declaration, or arrangement.

9. The SETI Committee of the International Academy of Astronautics, in coordination with Commission 51 of the International Astronomical Union, will conduct a continuing review of procedures for the detection of extraterrestrial intelligence and the subsequent handling of the data. Should credible evidence of extraterrestrial intelligence be discovered, an international committee of scientists and other experts should be established to serve as a focal point for continuing analysis of all observational evidence collected in the aftermath of a discovery, and also to provide advice on the release of information to the public. This committee should be constituted from representatives of each of the international institutions listed above and such other members as the committee may deem necessary. To facilitate the convocation of such a committee at some unknown time in the future, the SETI Committee of the International Academy of Astronautics should initiate and maintain a current list of willing representatives from each of the international institutions listed above, as well as other individuals with relevant skills, and should make that list continuously available through the Secretariat of the International Academy of Astronautics. The International Academy of Astronautics will act as the Depository for this Declaration and will annually provide a current list of parties to all the parties to this Declaration.

Text of draft Declaration of Principles Concerning the Sending of Communications to Extraterrestrial Intelligence

The States participating in this Declaration,

Recognizing that a scientific search for evidence of extraterrestrial intelligence is being conducted with increasingly effective means,

Acknowledging the possibility of discovering such evidence,

Recognizing the potentially profound importance of such a discovery for Humankind,

Noting the existence of procedures for the verification and announcement of a detection of extraterrestrial intelligence,

Conscious of the question of whether and how Humankind should send a communication to extraterrestrial intelligence,

Desiring to establish an orderly process for dealing with that question,

Agree to the following Principles:

I. International consultations should be initiated to consider the question of sending communications to extraterrestrial civilizations.

II. Consultations on whether a message should be sent, and its content, should take place within the Committee on the Peaceful Uses of Outer Space of the United Nations and within other governmental and non-governmental orga-

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nizations, and should accommodate participation by qualified, interested groups that can contribute constructively to these consultations.

III. These consultations should be open to participation by all interested States and should be intended to lead to recommendations reflecting a consensus.

IV. The United Nations General Assembly should consider making the decision on whether or not to send a message to extraterrestrial intelligence, and on what the content of that message should be, based on recommendations from the Committee on the Peaceful Uses of Outer Space and from governmental and non-governmental organizations.

V. If a decision is made to send a message to extraterrestrial intelligence, it should be sent on behalf of all Humankind, rather than from individual States.

VI. The content of such a message should reflect a careful concern for the broad interests and well-being of Humanity, and should be made available to the public in advance of transmission.

VII. As the sending of a communication to extraterrestrial intelligence could lead to an exchange of communications separated by many years, consideration should be given to a long-term institutional framework for such communications.

VIII. No communication to extraterrestrial intelligence should be sent by any State until appropriate international consultations have taken place. States should not cooperate with attempts to communicate with extraterrestrial intelligence that do not conform to the principles in this Declaration.

IX. In their deliberations on these questions, States participating in this Declaration and United Nations bodies should draw on the expertise of scientists, scholars, and other persons with relevant knowledge.

X. Should a decision be made to send a communication, the encoding and transmission of the message should be assigned to scientists and engineers specializing in the technologies required.

Suggested Reading

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About the Author

Michael Michaud was a professional American diplomat for 32 years before retiring in 1995 to be a full-time writer. He served as Director of the State Department's Office of Advanced Technology, as Counselor for Science, Technology, and Environment at the American Embassy in Paris, and as Minister-Counselor for Science, Technology, and Environment at the American Embassy in Tokyo. He is the author of over 100 published works, including the 1986 book Reaching for the High Frontier *about the American pro-space movement. Now living in Geneva, Switzerland, he is completing a novel about the interaction of two civilizations: Mexico and Southern California.*

There are two ways of spreading light: to be the candle or the mirror that reflects it.

—Edith Wharton

It is never too late to be what you might have been.

—George Eliot

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Ben Bova

THE QUESTION

Some things are very simple—but far from easy!

As soon as questions of will or decision or choice of action arise, science is at a loss.

—Noam Chomsky

The Discoverer

Not many men choose their honeymoon site for its clear night skies, nor do they leave their beds in the pre-dawn hours to climb up to the roof of their rented cottage. At least Hal Jacobs's bride understood his strange passion.

Linda Krauss-Jacobs, like her husband, was an amateur astronomer. In fact, the couple had met at a summer outing of the South Connecticut Astronomical Society. Now, however, she shivered in the moonless dark of the chill New Mexico night as Jacobs wrestled with the small but powerful electronically boosted telescope he was trying to set up on the sloping roof, muttering to himself as he worked in the dark.

"It'll be dawn soon," Linda warned.

"Yeah," said Hal. "Then we get back to bed."

That thought did not displease Linda. She was not as dedicated an astronomer as her husband. Maybe dedicated isn't the right word, she thought. Fanatic would be more like it. Still, there were three comets in the solar system that bore the Jacobs name, and he was intent on discovering more, honeymoon or not.

His mutterings and fumblings ceased. Linda knew he had the little telescope working at last.

"Can I see?" she asked.

"Sure," he said, without looking up from the tiny display screen. "In a min—hey! Look at that!"

Stepping carefully on the rounded roof tiles, he moved over enough so that she could peek over his shoulder at the cold green-tinted screen. A fuzzy blob filled its center.

"There wasn't anything like that in that location last night," Jacobs said, his voice trembling slightly.

"Is it a comet?" Linda wondered aloud.

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"Got to be," he said. Then he added, "And a big one, too. Look how bright it is!"

The Radio Astronomer

"It's not a comet," said Ellis de Groot. "That much is definite."

He was sitting behind his desk, leaning far back in his comfortable, worn old leather swivel chair, his booted feet resting on the edge of the desk. Yet he looked grim, worried. A dozen photographs of Comet Jacobs-Kawanashi were strewn across the desk top.

"How can you be so sure?" asked Brian Martinson, who sat in front of the desk, his eyes on the computer-enhanced photos. Martinson was still young, but he was already balding and his once-trim waistline had expanded from too many hours spent at consoles and classrooms and not enough fresh air and exercise. Even so, his mind was sharp and quick; he had been the best astronomy student de Groot had ever had. He now ran the National Radio Astronomy Observatory in West Virginia.

De Groot was old enough to be Martinson's father, gray and balding, his face lined from years of squinting at telescope images and wheedling university officials and politicians for enough funding to continue searching the Universe. He wore a rumpled open-necked plaid shirt and Levis so faded and shabby that they were the envy of the university's entire student body.

He swung his legs off the desk and leaned forward, toward the younger man. Tapping a forefinger on one of the photos, he lowered his voice to a whisper: "Only nine people in the whole country know about this. We haven't released this information to the media yet, or even put it on the Net. . . ." he paused dramatically.

"What is it?" Martinson asked, leaning forward himself.

"This so-called comet has taken up an orbit around Jupiter."

Martinson's jaw dropped open.

"It's not a natural event," de Groot went on. "We got a couple of NASA people to analyze the orbital mechanics. The thing was on a hyperbolic trajectory through the Solar System. It applied thrust, altered its trajectory, and established a highly eccentric orbit around Jupiter. Over the course of the past three days it has circularized that orbit."

"It's intelligent," Martinson said, his voice hollow with awe.

"Got to be," agreed de Groot. "That's why we want you to try to establish radio contact with it."

The National Security Advisor

Brian Martinson felt out of place in this basement office. He had gone through four separate security checkpoints to get into the stuffy little underground room, including a massive Marine Corps sergeant in full-dress uniform with a huge gun holstered at his hip, impassive and unshakable as a robot. But what really bothered him was the thought that the President of the United States was just upstairs from here, in the Oval Office.

The woman who glared at him from across her desk looked tough enough to lead a regiment of Marines into battle—which she had done, earlier in her career. Now Jo Costanza

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had even weightier responsibilities.

"You're saying that this is a spacecraft, piloted by intelligent alien creatures?" she asked. Her voice was diamond hard. The business suit she wore was a no-nonsense navy blue, her only jewelry a bronze Marine Corps globe and anchor on its lapel.

"It's a spacecraft," said Martinson. "Whether it's crewed or not we simply don't know."

"It's made no reply to your messages?"

"No, but—"

"Who authorized you to send messages to it?" snapped the third person in the office, a bland-looking guy with thinning slicked-back sandy hair and rimless eyeglasses that made him look owlish. He was wearing a light gray silk suit with a striped red and gray tie.

Martinson had put on the only suit he possessed for this meeting, the one he saved for international symposia; it was a conservative dark blue, badly wrinkled, and tight around the middle. Clearing his throat nervously, he replied, "Dr. Ogilvy authorized trying to make contact. He's head of the radio astronomy section of the National Science Foundation. That's where our funding comes from, and—"

"They went by protocol," Costanza said, making it sound as if she wished otherwise.

"But this is a national security matter," snapped the anonymous man.

"This is a *global* security matter," Martinson said.

Costanza and the other man stared at him.

"The spacecraft broke out of Jupiter orbit this morning," Martinson told them.

"It's heading here!" Costanza said in a breathless whisper.

"No," said Martinson. "It's heading out of the Solar System."

Before they could sigh with relief, he added, "But it's sent us a message."

"I thought you said it made no reply!"

"It hasn't replied to our messages," Martinson said wearily. "But it's sent a message of its own."

He pulled the tape recorder out of his jacket pocket.

The President of the United States

His nervousness, Martinson realized, had not stemmed from being in the White House. It came from the message he carried. Now that he had played it, and explained it, to the National Security Advisor and her aide, he felt almost at ease as they led him upstairs to the Oval Office.

The President looked smaller than he did on television, but that square-jawed face was recognizable anywhere. And the famous steel-gray eyes, the "laser eyes" that the media made so much of: they seemed to be boring into Martinson, making him feel as if the President was trying to x-ray him.

After Martinson explained the situation once again, though, both he and the President relaxed a bit.

"Then this thing is no threat to us," said the President.

"No sir, it's not," Martinson replied. "It's an opportunity. You might say it's a godsend."

"Let me hear that tape again," the President said.

Martinson pushed buttons on the recorder. It had not left his hand since he'd first yanked it out of his pocket

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in the National Security Advisor's office. His hand had been sweaty then, but now it barely trembled.

"I'm running it back to the start of the English section," he said as the little machine whirred. "They sent the same message in more than a hundred different languages."

The whirring stopped and a rich, pleasant baritone voice came from the tape recorder:

"Greeting to the English-speaking people of Earth. We are pleased to find intelligence wherever in the universe it may exist. We have finished our survey of your planetary system and are now leaving for our next destination. As a token of our esteem and good will, we will answer one question from your planet. Ask us anything you wish, and we will answer it to the best and fullest of our ability. But it can be one question only. You have seven of your days to contact us. After local midnight at your Greenwich meridian on the seventh day we will no longer reply to you."

The click of the tape recorder's off switch sounded like a rifle shot in the Oval Office.

The President heaved a long sigh. "They must have a sense of humor," he murmured.

"It's a hoax," said the four-star Air Force general sitting to one side of the President's desk. "Some wise-ass scientists have cooked up this scheme to get more funding for themselves."

"I resent that," Martinson said, with a tight smile. "And your own receivers must have picked up the message, it was sent in the broadest spectrum I've ever seen. Ask your technical specialists to trace the origin of the message. It came from the alien spacecraft."

The general made a sour face.

"You're certain that it's genuine, then," said the President.

"Yes, sir, I am," Martinson replied. "Kind of strange, but genuine."

"One question," muttered the President's science advisor, a man Martinson had once heard lecture at MIT.

"One question. That's all they'll answer."

"But why just one question?" Costanza demanded, her brow furrowed. "What's the point?"

"I suppose we could ask them why they've limited us to one question," said the science advisor.

"But that would count as our one question, wouldn't it?" Martinson pointed out.

The President turned to his science advisor. "Phil, how long would it take us to get out there and make physical contact with the alien ship?"

The bald old man shook his head sadly. "We simply don't have the resources to send a crewed mission in less than a decade. Even an unmanned spacecraft would need two years after launch, more or less, to reach the vicinity of Jupiter."

"They'd be long gone by then," said Costanza.

"They'll be out of the Solar System in a week," Martinson said.

"One question," the President repeated.

"What should it be?"

"That's simple," said the Air Force general. "Ask them how their propulsion system works. If they can travel interstellar distances their propulsion

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system must be able to handle incredible energies. Get that and we've got the world by the tail!"

"Do you think they'd tell us?"

"They said they'd answer any question we ask."

"I would be more inclined to ask a more general question," said the science advisor, "such as how they reconcile quantum dynamics with relativistic gravity."

"Bullcrap!" the general snapped. "That won't do us any good."

"But it would," the science advisor countered. "If we can reconcile all the forces we will have unraveled the final secrets of physics. Everything else will fall into our laps."

"Too damned theoretical," the general insisted. "We've got the opportunity to get some hard, practical information and you want them to do your math homework for you."

The President's chief of staff, who had been silent up until this moment, said, "Well, what I'd like to know is how we can cure cancer and other diseases."

"AIDS," said the President. "If we could get a cure for AIDS during my administration—"

Costanza said, "Maybe the general's right. Their propulsion system could be adapted to other purposes, I imagine."

"Like weaponry," said the science advisor, with obvious distaste.

Martinson listened to them wrangling. His own idea was to ask the aliens about the Big Bang and how old the Universe was.

Their voices rose. Everyone in the Oval Office had his or her own idea of what The Question should be. The argument became heated.

Finally the President hushed them all with a curt gesture. "If the eight people in this room can't come to an agreement, imagine what Congress is going to do with this problem."

"You're going to tell Congress about this?"

"Got to," the President replied unhappily. "The aliens have sent this message out to every major language group in the world, according to Dr. Martinson. It's not a secret anymore."

"Congress." The general groaned.

"That's nothing," said Costanza. "Wait till the United Nations sinks their teeth into this."

The Secretary General

Two wars, a spreading famine in central Africa, a new *el niño* event turning half the world's weather crazy, and now this—aliens from outer space. The Secretary General sank deep into her favorite couch and wished she were back in Argentina, in the simple Andean village where she had been born. All she had to worry about then was getting good grades in school and fending off the boys who wanted to seduce her.

She had spent the morning with the COPUOS executive committee, and had listened with all her attention to their explanation of the enigmatic alien visitation. It sounded almost like a joke, a prank that some very bright students might try to pull—until the committee members began to fight over what The Question should be. Grown men and women, screaming at each other like street urchins!

Now the delegation from the Pan

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Asian Coalition sat before her, arrayed like a score of round-faced Buddhas in western business suits. Most of them wore dark gray; the younger members dared to dress in dark blue.

The Secretary General was famous—perhaps notorious—for her preference for the bright, bold colors of her Andean heritage. Her frock was dramatic red and gold, the colors of a mountain sunset.

The chairman of the group, who was Chinese, was saying, "Inasmuch as PAC represents the majority of the world population—"

"Nearly four billion people," added the Vietnamese delegate, sitting to the right of the Chinese. He was the youngest man in the group, slim and wiry and eager, his spiky unruly hair still dark and thick.

The chairman nodded slightly, his only concession to his colleague's interruption, then continued, "It is only fair and democratic that *our* organization should decide what The Question will be."

More than four billion people, the Secretary General thought, yet not one woman has been granted a place on your committee. She knew it rankled these men that they had to deal with her. She saw how displeased they were that her office bore so few trappings of hierarchical power: no desk, no long conference table, only a comfortable scattering of small couches and armchairs. The walls, of course, were electronic. Virtually any data stored in any computer in the world could be displayed at the touch of a finger.

The chairman had finished his little statement and laced his fingers together over the dark gray vest stretched across his ample stomach. It is time for me to reply, the Secretary General realized.

She took a sip from the crystal tumbler on the teak table beside her couch. She did not especially like the taste of carbonated water, but it was best to stay away from alcohol during these meetings.

"I recognize that the member nations of the Pan Asian Coalition hold the preponderance of the world's population," she said, stalling for time while she tried to think of the properly diplomatic phrasing, "but the decision as to what The Question shall be must be shared by all the world's peoples."

"The decision must be made by vote in the General Assembly," the chairman insisted quietly. "That is the only fair and democratic way to make the choice."

"And we have only five more days to decide," added the Vietnamese delegate.

The Secretary General said, "We have made some progress. The International Astronomical Union has decided that The Question will be sent from the radio telescope in Puerto Rico—"

"Arecibo," the Vietnamese amended impatiently.

"Yes, thank you," murmured the Secretary General. "Arecibo. The astronomers have sent a message to the aliens that we have chosen the Arecibo radio telescope to ask The Question and any other transmission from any other facility should be ignored."

"Thus the Americans have taken ef-

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fective control of the situation," said the chairman, in the calm low voice of a man who has learned to control his inner rage.

"Not at all," the Secretary General replied. "Arecibo is an international facility; astronomers from all over the world work there."

"Under Yankee supervision."

"The International Astronomical Union—"

"Which is dominated by Americans and Europeans," shouted one of the other delegates.

"We will not tolerate their monopoly power politics!"

"Asia must make the decision!"

Stunned by the sudden vehemence of her visitors, the Secretary General said, "A moment ago you wanted the General Assembly to vote on the decision."

The chairman allowed a fleeting expression of chagrin to break his normally impassive features. "We took the liberty of polling the members of the General Assembly yesterday."

"Very informally," added the Vietnamese hastily. "Nothing binding, of course."

"Of course," said the Secretary General, surprised that her snoops had not reported this move to her.

"The result was far from satisfactory," the chairman admitted. "We received more than two hundred different questions."

"It appears extremely doubtful," said the Japanese member of the delegation, "that the General Assembly could agree on one single question within the remaining allowed time."

"Then how do you propose to resolve the matter?" the Secretary General asked.

They all looked to the chairman, even the Vietnamese delegate.

He cleared his throat, then answered, "We propose to decide what The Question will be within our own group, and then ask the General Assembly to ratify our decision."

"A simple yes or no vote," said the Vietnamese. "No thought required."

"I see," said the Secretary General. "That might work, although if the General Assembly voted against your proposal—"

"That will not come to pass," the chairman assured her. "The nations we represent will carry the vote."

"Your nations have the largest population," the Secretary General cautioned, "but not the largest number of representatives in the Assembly, where it is one vote to each nation."

"The Africans will vote with us."

"Are you certain?"

"If they want continued aid from us, they will."

The Secretary General wondered if the Africans might not want to ask the aliens how they can make themselves self-sufficient, but she kept that thought to herself. Instead she asked, "Have you settled on the question you wish to ask?"

The chairman's left cheek ticked once. "Not yet," he answered. "We are still discussing the matter."

"How close to a decision are you?"

A gloomy silence filled the room.

At last the young Vietnamese burst out, "They want to ask how they can live forever! What nonsense! The Question should be, How can we control our population growth!"

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"We know how to control population growth," the Japanese delegate snarled. "That is not a fit question to ask the aliens."

"But our known methods are not working!" the Vietnamese insisted. "We must learn how we can make people *want* to control their births."

"Better to ask how we can learn to control impetuous young men who show no respect for their elders," snapped one of the grayest delegates.

The Secretary General watched in growing dismay as the delegates quarreled and growled at each other. Their voices rose to shouts, then screams. When they began attacking each other in a frenzy of martial arts violence, the Secretary General called for security, then hid behind her couch.

The Media Mogul

"This is the greatest story since Moses parted the Red Sea!" Tad Trumble enthused. "I want our full resources behind it."

"Right, chief," said the seventeen executive vice presidents arrayed down the long conference table.

"I mean our *full* resources," Trumble said, pacing energetically long the length of the table. He wore his yachting costume: navy blue double-breasted blazer over white duck slacks, colorful ascot and off-white shirt. He was a big man, tall and rangy, with a vigorous mustache and handsome wavy hair—both dyed to a youthful dark brown.

"I mean," he went on, clapping his big hands together hard enough to make the vice presidents jump, "I want to interview those aliens personally."

"You?" the most senior of the veeps exclaimed. "Yourself?"

"Danged right! Get them on-screen."

"But they haven't replied to any of our messages, chief," said the brightest of the female vice presidents. In truth, she was brighter than all the males, too.

"Not one peep out of them since they said they'd answer The Question," added the man closest to her.

Trumble frowned like a little boy who hadn't received quite what he'd wanted from Santa Claus. "Then we'll just have to send somebody out to their spacecraft and bang on their door until they open up."

"We can't do that," said one of the younger, less experienced toadies.

Whirling on the hapless young man, Trumble snapped, "Why the frick not?"

"W . . . well, we'd need a rocket and astronauts and—"

"My aerospace division has all that crap. I'll tell 'em to send one of our anchormen up there."

"In four days, chief?"

"Sure, why not? We're not the freakin' government, we can do things fast!"

"But the safety factor . . ."

Trumble shrugged. "If the rocket blows up it'll make a great story. So we lose an anchorman, so what? Make a martyr outta him. Blame the aliens."

It took nearly an hour for the accumulated vice presidents to gently, subtly talk their boss out of the space mission idea.

"OK, then," Trumble said, still pacing, his enthusiasm hardly dented,

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"how about this? We sponsor a contest to decide what The Question should be!"

"That's great!" came the immediate choral reply.

"Awesome."

"Fabulous."

"Inspired."

"Danged right," Trumble admitted modestly. "Ask people all over the country—all over the freakin' *world*—what they think The Question should be. Nobody'll watch anything but our channels!"

Another round of congratulations surged down the table.

"But get one thing straight," Trumble said, his face suddenly very serious. He had managed to pace himself back to his own chair at the head of the table.

Gripping the back of the empty chair with both white-knuckled hands, he said, "I win the contest. Understand? No matter how many people respond, *I'm* the one who makes up The Question. Got that?"

All seventeen heads nodded in unison.

The Pope

"It is not a problem of knowledge," said Cardinal Horvath, his voice a sibilant whisper, "but rather a problem of morality."

The Pope knew that Horvath used that whisper to get attention. Each of the twenty-six cardinals in his audience chamber leaned forward on his chair to hear the Hungarian prelate.

"Morality?" asked the Pope. He had been advised by his staff to wear formal robes for this meeting. Instead, he had chosen to present himself to his inner circle of advisors in a simple white linen suit. The cardinals were all arrayed in their finest, from scarlet skullcaps to Gucci shoes.

"Morality," Horvath repeated. "Is this alien spaceship sent to us by God or by the devil?"

The Pope glanced around the gleaming ebony table. His cardinals were clearly uneasy with Horvath's question. They believed in Satan, of course, but it was more of a theoretical belief, a matter of catechistic foundations that were best left underground and out of sight in this modern age. In a generation raised on *Star Trek*, the idea that aliens from outer space might be sent by the devil seemed medieval, ridiculous.

And yet . . .

"These alien creatures," Horvath asked, "why do they not show themselves to us? Why do they offer to answer one question and only one?"

Cardinal O'Shea nodded. He was a big man, with a heavy, beefy face and flaming red hair that was almost matched by his bulbous imbiber's nose.

"You notice, don't you," O'Shea said in his sweet clear tenor voice, "that all the national governments are arguing about which question to ask. And what are they suggesting for The Question? How can they get more power, more wealth, more comfort and ease from the knowledge of these aliens."

"Several suggestions involve curing desperate diseases," commented Cardinal Ngono dryly. "If the aliens can give us a cure for AIDS or ebola, I would say they are doing God's work."

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"By their fruits you shall know them," the Pope murmured.

"That is exactly the point," Horvath said, tapping his fingers on the gleaming table top. "Why do they insist on answering only one question? Does that bring out the best in our souls, or the worst?"

Before they could discuss the cardinal's question, the Pope said, "We have been asked by the International Astronomical Union's Catholic members to contribute our considered opinion to their deliberations. How should we respond?"

"There are only three days left," Cardinal Sarducci pointed out.

"How should we respond?" the Pope repeated.

"Ignore the aliens," Horvath hissed. "They are the work of the devil, sent to tempt us."

"What evidence do you have of that?" Ngono asked pointedly.

Horvath stared at the African for a long moment. At last he said, "When God sent His Redeemer to mankind, He did not send aliens in a spaceship. He sent the Son of Man, who was also the Son of God."

"That was a long time ago," came a faint voice from the far end of the table.

"Yes," O'Shea agreed. "In today's world Jesus would be ignored . . . or locked up as a panhandler."

Horvath sputtered.

"If God wanted to get our attention," Ngono said, "this alien spacecraft has certainly accomplished that."

"Let us assume, then," said the Pope, "that we are agreed to offer some response to the astronomers' request. What should we tell them?"

Horvath shook his head and folded his arms across his chest in stubborn silence.

"Are you asking, Your Holiness, if we should frame The Question for them?"

The Pope shrugged slightly. "I am certain they would like to have our suggestion for what The Question should be."

"How can we live in peace?"

"How can we live without disease?" Ngono suggested.

"How can we end world hunger?"

Horvath slapped both hands palm down on the table. "You all miss the point. The Question should be—must be!—how can we bring all of God's people into the One True Church?"

Most of the cardinals groaned.

"That would set the ecumenical movement back to the Middle Ages!"

"It would divide the world into warring camps!"

"Not if the aliens are truly sent by God," Horvath insisted. "But if they are the devil's minions, then of course they will cause us grief."

The Pope sagged back in his chair. Horvath is an atavism, a walking fossil, but he has a valid point, the Pope said to himself. It's almost laughable. We can test whether or not the aliens are sent by God by taking a chance on fanning the flames of division and hatred that will destroy us all.

He felt tired, drained—and more than a little afraid. Perhaps Horvath is right and these aliens are a test.

One Question. He knew what he would ask, if the decision were entirely his own. And the knowledge frightened him. Deep in his soul, for the

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first time since he'd been a teenager, the Pope knew that he wanted to ask if God really existed.

The Man in the Street

"I think it's all a trick," said Jake Belasco, smirking into the TV camera. "There ain't no aliens and there never was."

The blonde interviewer had gathered enough of a crowd around her and her cameraman that she was glad the station had sent a couple of uniformed security lugs along. The shopping mall was fairly busy at this time of the afternoon and the crowd was building up fast. Too bad the first "man in the street" she picked to interview turned out to be this beer-smelling yahoo.

"So you don't believe the aliens actually exist," replied the blonde interviewer, struggling to keep her smile in place. "But the government seems to be taking the alien spacecraft seriously."

"Ahhh, it's all a lotta baloney to pump more money into NASA. You wait, you'll see. There ain't no aliens and there never was."

"Well, thank you for your opinion," the interviewer said. She turned slightly and stuck her microphone under the nose of a sweet-faced young woman with startling blue eyes.

"And do you think the aliens are nothing more than a figment of NASA's public relations efforts?"

"Oh no," the young woman replied, in a soft voice. "No, the aliens are very real."

"You believe the government, then."

"I *know* the aliens exist. They took me aboard their spacecraft when I was nine years old."

The interviewer closed her eyes and silently counted to ten as the young woman began to explain in intimate detail the medical procedures that the aliens subjected her to.

"I'm carrying their seed now," she said, still as sweetly as a mother crooning a lullaby. "My babies will all be half aliens."

The interviewer wanted to move on to somebody reasonably sane, but the sweet young woman was gripping her microphone with both hands and would not let go.

The Chairman

"People, if we can't come up with a satisfactory question, the politicians are going to take the matter out of our hands!"

The meeting hall was nearly half filled, with more men and women arriving every minute. Too many, Madeleine Dubois thought as she stood at the podium with the rest of the committee seated on the stage behind her. Head of the National Science Foundation's astronomy branch, she had the dubious responsibility of coming up with a recommendation from the American astronomical community for The Question—before noon, Washington time.

"Are you naive enough to think for one minute," challenged a portly bearded young astronomer, "that the politicians are going to listen to what we say?"

Dubois had battled her way through glass ceilings in academia and government. She had no illusions, but

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she recognized an opportunity when she saw one.

"They'll have no choice but to accept our recommendation," she said, with one eye on the news reporters sitting in their own section of the big auditorium. "We represent the only uninterested, unbiased group in the country. We speak for science, for the betterment of the human race. Who else has been actively working to find extraterrestrial intelligence for all these many years?"

To her credit, Dubois had worked out a protocol with the International Astronomical Union, after two days of frantic, frenzied negotiations. Each member nation's astronomers would decide on a question, then the Union's executive committee—of which she was chair this year—would vote on the various suggestions.

By noon, she told herself, we'll present The Question we've chosen to the leaders of every government on Earth. And to the news media, of course. The politicians will *have to* accept our choice. There'll only be about seven hours left before the deadline falls.

She had tried to keep this meeting as small as possible, yet by the time every committee within the astronomy branch of NSF had been notified, several hundred men and women had hurried to Washington to participate. Each of them had her or his own idea of what The Question should be.

Dubois knew what she wanted to ask: What was the state of the universe before the Big Bang? She had never been able to accept the concept that all the matter and energy of the universe originated out of quantum fluctuations in the vacuum. Even if that was right, it meant that a vacuum existed before the Big Bang, and where did *that* come from?

So patiently, tirelessly, she tried to lead the several hundred astronomers toward a consensus on The Question. Within two hours she gave up trying to get her question accepted; within four hours she was despairing of reaching any agreement at all.

Brian Martinson sat in a back row of the auditorium, watching his colleagues wrangle like lawyers. No, worse, he thought. They're behaving like cosmologists!

An observational astronomer who believed in hard data, Martinson had always considered cosmologists to be theologians of astronomy. They took a pinch of observational data and added tons of speculation, carefully disguised as mathematical formulations. Every time a new observation was made, the cosmologists invented seventeen new explanations for it—most of them contradicting one another.

He sighed. This is getting us no place. There won't be an agreement here, any more than there was one in the Oval Office, five days ago. He peered at his wristwatch, then pushed himself out of the chair.

The man sitting next to him asked, "You're leaving? Now?"

"Got to," Martinson explained over the noise of rancorous shouting. "I've got an Air Force jet waiting to take me to Arecibo."

"Oh?"

"I'm supposed to be supervising the big dish when we ask The Question." Martinson looked around at his

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red-faced, flustered colleagues, then added, "If we ever come to an agreement on what it should be."

The Dictator

"Arecibo is only a few hours from here, by jet transport," the Dictator repeated, staring out the ceiling-high windows of his office at the troops assembled on the plaza below. "Our paratroops can get there and seize the radio telescope facility well before eighteen hundred hours."

His minister of foreign affairs, a career diplomat who had survived four *coups d'état* and two revolutions by the simple expedient of agreeing with whichever clique seized power, cast a dubious eye at his latest Maximum Leader.

"A military attack on Puerto Rico is an attack on the United States," he said, as mildly as he could, considering the wretched state of his stomach.

The Dictator turned to glare at him. "So?"

"The Yankees will not let an attack on their territory go unanswered. They will strike back at us."

The Dictator toyed with his luxuriant mustache, a maneuver he used whenever he wanted to hide inner misgivings. At last he laughed and said, "What can the Gringos do, once I have asked The Question?"

The foreign minister knew better than to argue. He simply sat in the leather wing chair and stared at the Dictator, who looked splendid in his full-dress military uniform with all the medals and the sash of office crossing his proud chest.

"Yes," the Dictator went on, convincing himself (if not the foreign minister), "it is all so simple. While the scientists and world leaders fumble and agonize over what The Question should be, I—your Maximum Leader—knew instantly what I wanted to ask. I knew it! Without a moment of hesitation."

The spacious, high-ceilinged palace room seemed strangely warm to the foreign minister. He pulled the handkerchief from the breast pocket of his jacket and mopped his fevered brow.

"Yes," the Dictator was going on, congratulating himself, "while the philosophers and weaklings try to reach an agreement, I act. I seize the radio telescope and send to the alien visitors The Question. *My* question!"

"The man of action always knows what to do," the foreign minister parroted.

"Exactly! I knew what The Question should be, what it must be. How can I rule the world? What other question matters?"

"But to ask it, you must have the Arecibo facility in your grasp."

"For only a few hours. Even one single hour will do."

"Can your troops operate the radio telescope?"

A cloud flickered across the Dictator's face, but it passed almost as soon as it appeared.

"No, of course not," he replied genially. "They are soldiers, not scientists. But the scientists who make up the staff at Arecibo will operate the radio telescope for us."

"You are certain . . . ?"

"With guns at their heads?" The Dictator threw his head back and laughed.

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"Yes, they will do what they are told. We may have to shoot one or two, to convince the others, but they will do what they are told, never fear."

"And afterward? How do the troops get away?"

The Dictator shrugged. "There has not been enough time to plan for removing them from Arecibo."

Eyes widening, stomach clenching, the foreign minister gasped, "You're going to leave them there?"

"They are all volunteers."

"And when the Yankee Marines arrive? What then?"

"What difference? By then I will have the answer from the aliens. What are the lives of a handful of martyrs compared to the glory of ruling the entire world?"

The foreign minister struggled to his feet. "You must forgive me, my leader. My stomach . . ."

And he lurched toward the bathroom, hoping he could keep himself from retching until he got to the toilet.

The Radio Astronomer

At least the military was operating efficiently, Brian Martinson thought as he winged at supersonic speed high above the Atlantic. An Air Force sedan had been waiting for him in front of the NSF headquarters; its sergeant driver whisked him quickly through the downtown Washington traffic and out to Andrews Air Force Base, where a sleek swept-wing, twin-jet VIP plane was waiting to fly him to Puerto Rico.

Looking idly through the small window at his side, his mind filled with conflicting ideas about the aliens and The Question, Martinson realized that he could actually see the Gulf Stream slicing through the colder Atlantic waters, a bright blue ribbon of warmth and life against the steely gray of the ocean.

Looking out to the flat horizon he could make out the ghost of a quarter Moon hanging in the bright sky. Somewhere beyond the Moon, far, far beyond it, the aliens in their spacecraft were already on their way out of the Solar System.

What do they want of us? Martinson wondered. Why did they bother to make contact with us at all, if all they're willing to do is answer one damned question? Maybe they're not such good guys. Maybe this is all a weird plot to get us to tear ourselves apart. One question. Half the world is arguing with the other half over what The Question should be. With only a few hours left, they still haven't been able to decide.

Sure, he thought to himself, it could all be a set-up. They tell us we can ask one question, knowing that we might end up fighting a goddamned war over what The Question should be. What better way to divide us, and then walk in and take over the remains?

No, a saner voice in his mind answered. That's paranoid stupidity. Their spacecraft is already zooming out of the solar system, heading high above the ecliptic. They won't get within a couple of light-hours of Earth, for God's sake. They're not coming to invade us. By this time tomorrow they'll be on their way to Epsilon Eridani, near as I can figure their trajectory.

But what better way to divide us? he repeated silently. They couldn't have figured out a more diabolical method

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of driving us all nuts if they tried.

The Teenagers

"I think it's way cool," said Andy Hitchcock, as he lounged in the shade of the last oak tree left in Oak Park Acres.

"You mean the aliens?" asked Bob Wolfe, his inseparable buddy.

"Yeah, sure. Aliens from outer space. Imagine the stuff they must have. Coolisimo, Bobby boy."

"I guess."

The two teenagers had been riding their bikes through the quiet winding streets of Oak Park Acres most of the morning. They should have been in school, but the thought of another dreary day of classes while there were aliens up in the sky and the TV was full of people arguing about what The Question ought to be—it was too much to expect a guy to sit still in school while all this was going on.

Andy fished his palm-sized radio from his jeans and clicked it on. Didn't matter which station, they were all broadcasting nothing but news about The Question. Even the hardest rock stations were filled with talk instead of music. Not even bong-bong was going out on the air this morning.

" . . . Still no official statement from the White House," an announcer's deep voice was saying, "where the President is meeting in the Oval Office with the leaders of Congress and his closest advisors. . . ."

Click. Andy changed the station. ". . . Trading has been suspended for the day here at the Stock Exchange as all eyes turn skyward. . . ."

Click. " . . . European Community voted unanimously to send a note of protest to the United Nations concerning the way in which the General Assembly has failed. . . ."

Click. Andy turned the radio off.

"Those fartbrains still haven't figured out what The Question will be," Bob said, with the calm assurance that anyone older than himself shouldn't really have the awesome power of making decisions, anyway.

"They better decide soon," Andy said, peering at his wristwatch. "There's only a few hours left."

"They'll come up with something."

"Yeah, I suppose."

Both boys were silent for a while, sprawled out on the grass beneath the tree, their bikes resting against its trunk.

"Man, I know what I'd ask those aliens," Bob said at last.

"Yeah? What?"

"How can I ace the SATs? That's what I'd ask."

Andy thought a moment, then nodded. "Good thing you're not in charge, pal."

The Radio Astronomer

Brian Martinson had never seen an astronomical facility so filled with tension.

Radio telescope observatories usually look like the basement of an electronics hobby shop, crammed with humming consoles and jury-rigged wiring, smelling of fried circuit boards and stale pizza, music blaring from computer CD slots—anything from heavy metal to Mahler symphonies.

Today was different. People were

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still dressed in their usual tropical casual style: their cut-offs and sandals made Martinson feel stuffy in the suit he'd worn for the meeting in Washington. But the Arecibo facility was deathly quiet except for the ever-present buzz of the equipment. Everyone looked terribly uptight, pale, nervous.

After a routine tour of the facility, Martinson settled into the director's office, where he could look out the window at the huge metal-mesh-covered dish carved into the lush green hillside. Above the thousand-foot-wide reflector dangled the actual antenna, with its exquisitely tuned maser cooled down and ready to go.

The director herself sat at the desk, fidgeting nervously with the desktop computer, busying herself with it for the last few hours to the deadline. She was an older woman, streaks of gray in her buzz-cut hair, bone thin, dressed in a faded pair of cut-off jeans and a T-shirt that hung limply from her narrow shoulders. Martinson wondered how she could keep from shivering in the icy blast coming from the air-conditioning vents.

There were three separate telephone consoles on the desk: one was a direct line to the White House, one a special link to the U.N. Secretary General's office in New York. Martinson had asked the woman in charge of communications to keep a third line open for Madeleine Dubois, who—for all he knew—was still trying to bring order to the chaotic meeting at NSF headquarters.

He looked at his wristwatch. Four P.M. We've got three hours to go. Midnight Greenwich time is seven P.M. here. Three hours.

He felt hungry. A bad sign. Whenever he was really wired tight, he got the nibbles. His overweight problem had started during the final exams of his senior undergrad year and had continued right through graduate school and his post-doc. He kept expecting things to settle down, but the higher he went in the astronomical community the more responsibility he shouldered. And the more pressure he felt the more he felt the urge to munch.

What do I do if the White House tells me one thing and the U.N. something else? he wondered. No, that won't happen. They'll work it out between them. Dubois will present the IAU's recommendation to the President and the Secretary General at the same time.

Across the desk, the director tapped frenetically on her keyboard. What could she be doing? Martinson wondered. Busywork, came his answer. Keeping her fingers moving; it's better than gnawing your nails.

He turned his squeaking plastic chair to look out the window again. Gazing out at the lush tropical forest beyond the rim of the telescope dish, he tried to calm the rising tension in his own gut. The phone will ring any second now, he told himself. They'll give you The Question and you send it out to the aliens and that'll be that.

What if you don't like their choice? Martinson asked himself. Doesn't matter. When the White House talks, you listen. The only possible problem would be if Washington and the U.N. aren't in synch.

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The late afternoon calm was shattered by the roar of planes, several of them, flying low. Big planes, from the sound of it. Martinson felt the floor tremble beneath his feet.

The director looked up from her display screen, an angry scowl on her face. "What kind of brain-dead jerks are flying over us? This airspace is restricted!"

Martinson saw the planes: big lumbering four-engined jobs, six of them in two neat vees.

"Goddamned news media," the director grumbled.

"Six planes?" Martinson countered. "I don't think so. They looked like military jets."

"Didn't see any Air Force stars on 'em."

"They went by so fast. . . ."

His words died in his throat. Through the window he saw dozens of parachutes dotting the soft blue sky, drifting slowly, gracefully to the ground.

"What the hell?" the director growled.

His heart clutching in his chest, Martinson feared that he knew what was happening.

"Do you have a pair of binoculars handy?" he croaked, surprised at how dry his throat was.

The director wordlessly opened a drawer in her desk, reached in, and handed Martinson a heavy leather case. With fumbling hands he opened it and pulled out a big black set of binoculars.

"Good way to check out the antenna without leaving my office," she explained, tight-lipped.

Martinson put the lenses to his eyes and adjusted the focus. His hands were shaking so badly now that he had to lean his forearms against the windowsill.

The parachutists came into view. They wore camouflage military uniforms. He could see assault rifles and other weapons slung over their shoulders.

"Parachute troops," he whispered.

"Why the hell would the army drop parachute soldiers here? What do they think—"

"They're not ours," Martinson said. "That's for sure."

The director's eyes went wide. "What do you mean? Whose are they?"

Shaking his head, Martinson said, "I don't know. But they're not ours, I'm certain of that."

"They have to be ours! Who else would . . . ?" She stopped, her mind drawing the picture at last.

Without another word, the director grabbed the phone that linked with Washington and began yelling into it. Martinson licked his lips, made his decision, and headed for the door.

"Where're you going?" the director yelled at him.

"To stop them," he yelled back, over his shoulder.

Heart pounding, Martinson raced down the corridor that led to the control center. Wishing he had exercised more and eaten leaner cuisine, he pictured himself expiring of a heart attack before he could get the job done.

More likely you'll be gunned down by some soldier, he told himself.

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He reached the control room at last, bursting through the door, startling the already-nervous kids working the telescope.

"We're being invaded," he told them.

"Invaded?"

"What're you talking about?"

"Parachute troops are landing outside. They'll be coming in here in a couple of minutes."

"Parachute troops?"

"But why?"

"Who?"

The youngsters at the consoles looked as scared as Martinson felt. He spotted an empty chair, a little typist's seat off in a corner of the windowless room, and went to it. Wheeling it up to the main console, Martinson explained: "I don't know who sent them, but they're not our own troops. Whoever they are, they want to grab the telescope and send out their own version of The Question. We've got to stop them."

"Stop armed troops?"

"How?"

"By sending out The Question ourselves. If we get off the Question before they march in here, then it doesn't matter what they want, they'll be too late."

"Has Washington sent The Question?"

"No," Martinson admitted.

"The United Nations?"

He shook his head as he sat at the main console and scanned the dials. "Are we fully powered up?"

"Up and ready," said the technician seated beside him.

"How do I—"

"We rigged a voice circuit," the technician said. "Here."

He picked up a headset and handed it to Martinson, who slipped it over his sweaty hair and clapped the one earphone to his ear. Adjusting the pin-sized microphone in front of his lips, he asked, "How do I transmit?"

The technician pointed to a square black button on the console.

"But you don't have The Question yet," said an agonized voice from behind him.

Martinson did not reply. He leaned a thumb on the black button.

The door behind him banged open. A heavily-accented voice cried, "You are now our prisoners! You will do as I say!"

Martinson did not turn around. Staring at the black button of the transmitter, he spoke softly into his microphone, four swift whispered words that were amplified by the most powerful radio transmitter on the planet and sent with the speed of light toward the departing alien spacecraft.

Four words. The Question. It was a plea, an entreaty, a prayer from the depths of Martinson's soul, a supplication that was the only question he could think of that made any sense, that gave the human race any hope for the future:

"How do we decide?" ■

With thanks, once again, to Michael Bienes.

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Joseph H. Delaney

A JURY OF HIS PEERS

Calhoun's predicament gave new meaning to the old warning, "Be careful what you wish for. . . ."

Illustration by Arthur George

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Orville R. Calhoun, part-time country lawyer and full-time dope smuggler, sat mounted on a horse as nervous as he was and waited under cover of a clump of scrub mesquite for the mule train. Even though he was paying plenty for protection he knew there was no such thing as safe, not in this business. No matter how big or how powerful you were there was always somebody ready to jump you. Double-dealing was the rule in this game

Having the sheriff get popped with a ton of coke two weeks before at the provocation of one of his rivals didn't promote complacency, and lately, Joe Schreiber, that agitator over in the county seat, had been getting more and more reckless with the accusations in his radical newspaper, the *Tattletale*. With the chokehold the dopers had on the local criminal justice system there wasn't much chance he'd get anywhere, but any chance at all was too great a risk to take.

Though it was still way too early to expect to see any movement Orville raised his glasses and scanned the riverbank around the ford. Usually, he spotted the Mexican soldiers first. They almost always checked things out before sending the first mule across. Hiring them was expensive, but necessary, because while he could pay off the Border Patrol and the DEA only these soldiers had the muscle to discourage rival gangs from hijacking his shipments from the Mexican side.

A flash caught his eye, a glint of failing sunlight fleetingly reflected off some shiny object, maybe a gun barrel, Orville couldn't tell. The afternoon Sun was so low in the sky that the figure was nothing more than a silhouette. Instantly, he traversed and searched the area where this had appeared. The tiny motor inside the binoculars zoomed their focus out to infinity, and suddenly there it was, a dark figure, moving with a peculiar gait downstream toward the ford.

Quickly he scanned the area around it, noting the nearest landmark, so he could return and watch it. He saw nothing. A glance at the ford, some two and a half kilometers to the left, still revealed no sign of the soldiers.

Orville dropped the glasses on their strap, slipped his rifle out of its scabbard and spurred his horse into motion. He moved quickly toward the wash that ran down to the riverbank and ended just downstream of the figure he had seen. If he timed it right, and if the stranger continued at the same speed and direction, Orville would come out behind him.

As he rode, Calhoun pondered the possibilities. He hoped it was only a wetback, and its appearance now just coincidence. That was a good bet. Hijackers were professionals, and seldom that careless.

As the ravine widened the trail got easier and Calhoun got a grip on himself. By the time he reached its terminus, where an alluvial fan of sand and gravel, dropped by countless rains, left him a clear shot at anybody who might try to cross in front of him, he was feeling positively calm.

Until the figure burst out into full view. When that happened, Calhoun's heretofore mild concern turned into panic.

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The stranger wore an elaborate disguise. In the dusk he looked more like a beast than a man—and big, fully as large as any bear Orville had ever seen here in the Big Bend. Worse, he was armed, and had seen Orville. He turned and pointed the weapon, which before he had merely waved aimlessly around, as though trying to decide whether to shoot.

The thing didn't look much like a gun. Nevertheless, when the strange prickly sensation washed over his face and hands, Calhoun hesitated not an instant. He raised his rifle and dropped the stranger in his tracks.

Relief was mixed with regret. The report echoed down the walls of the ravine. Everyone near the ford would have heard it. There would be no delivery tonight. The Mexicans would suspect a double-cross on this side of the river and would flee. Calhoun would have to arrange a new rendezvous, endure the hassle of clearing the shipment with the fed's patrol all over again, grease more palms, renegotiate storage and transshipment—it went on and on.

He wanted a good look at the source of his trouble so he dismounted, rifle in hand, and carefully approached the motionless body lying on the gravel. He stopped short, and gasped when he realized this was not a man disguised.

The creature wore a drab coverall with many bulging pockets, so that in places its limbs looked lumpy, like sacks of potatoes. What clothing did not cover, hair did, though on its face this appeared to have been clipped very short, almost like a human beard. The eyes were enormous, and there were many of them, all covered with some kind of horny material. Two were faceted like insect eyes. Calhoun knew in that instant that his life had changed forever.

What before had been merely panic blossomed into stark terror. Calhoun realized an alien would not visit Earth alone. It would have companions, and if they had ears to hear the shot they might already be on the way to investigate. With night falling so rapidly now, Calhoun knew he might not see them coming.

And he was right on the mark; he didn't see the one that got him, although the darkness had nothing to do with that. The other creature had appeared out of thin air, right in front of him, accompanied by more prickly sensations, and shot him with something that froze all his voluntary muscles absolutely rigid. Calhoun toppled to the ground, his limbs retaining the pose they had when he was upright.

He could see only what was right in front of his eyes because he couldn't move his eyeballs. He knew there were several creatures now, he heard strange voices in excited but incomprehensible conversation. Periodically something that felt uncomfortably prickly swept across his face.

After the discussion they picked him up and carried him off. Face up, he could see only a wobbly, starry sky.

When the stars vanished Calhoun screamed soundlessly. He knew they had taken him inside something and that it might be a spaceship. He was already convinced they were extraterrestrials.

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Even though he was intensely curious he still tried as hard as he could to shut his eyes, which hurt badly. He couldn't do it, nor could he hope to scratch the maddening itch into which the prickly sensation had degenerated. He must bear the unbearable.

Momentarily, another flurry of alien conversation distracted him. It sounded excited, urgent. In the periphery of his vision he occasionally detected movement but he couldn't focus on it. Abruptly, the itching ceased, replaced by a sensation of tightening everywhere that clothing had not covered his skin.

Then, suddenly, Calhoun's body came to rest. He found himself staring unblinkingly ahead at some sort of wall as the creatures turned him upright and stood him on his feet.

They left him, propped in this corner where he could not fall over, to ponder his fate in complete darkness. With their fading voices Calhoun's last outside stimuli vanished.

"All right, Luqithur," Chairman Feevish growled at his project manager, "I think it's time for an explanation. Whatever possessed you to kidnap an alien and bring it home with you?"

"What was I supposed to do, kill it?"

Feevish cringed. He suspected Luqithur badly needed a rest. Like many people he had known whose work took them to primitive worlds and exposed them to barbaric cultures, Luqithur had become a little odd over the years. The veneer of civilization was thin, and the fact that Luqithur could even suggest intentionally killing another sapient frightened him. In all the world that happened perhaps once or twice a century.

Luqithur interpreted the chairman's silence as accusatory. He realized how his remark must have sounded. "We planned to let it go after the danger was over," he continued. "There've been other encounters where we did that. We're confident that some of the other natives who saw us told others but we know from the studies we've made that the alien authorities don't take such reports very seriously."

"Why didn't you let it go?"

"I considered it. It didn't seem wise under the circumstances. You see, it attacked my survey crew during what turned out to be final tests—tests that confirmed it should be possible to stabilize the anomaly and use it."

"Why didn't you tell me that before? That's wonderful news."

"For my people, maybe," Luqithur replied, now relieved that the news had taken heat off him. "But I feel sorry for the diplomats who're going to have to negotiate with these people. That was the primary reason for my decision, to make things easier for them.

"I was briefed by the foreign ministry when we first started the project. I know the general plan for contact. It doesn't involve telling the Earthians how long we were on their planet. We'll just tell them we discovered the anomaly from space, which we actually did, though a long time ago, and not about any of our activities on the ground."

"I see," Feevish replied. It was he who was now abashed. Luqithur was right, of course. With contact coming

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relatively soon after the incident their prisoner's story would have been credible and other Earthians would have believed it. This was better.

But Feevish was still curious. "You said that was one reason. What are the others?"

"So that the Earthian will not escape punishment for killing one of my surveyors," Luquither answered grimly. "We couldn't very well ask the Earthians to do it, not that it's likely they would have."

"Oh? You didn't tell me about that," Feevish replied. Luqithur's casual treatment of so gruesome a subject left Feevish even more convinced the other was on the brink of barbarism himself.

Calhoun followed the bug-eyed monster through a huge round door and suddenly the fragile hypothesis he had been so carefully nursing collapsed. Stark reality, far beyond his ability to control, furnished him with new, but unpleasant, answers.

Before, he had not understood why the alien had insisted he don the floor-length robe and the thick face mask. Now, as he gazed out on this hellish landscape he realized he had spent those long and agonizing weeks aboard an alien ship, not on Earth.

Now, many things were clear to him, especially the futility of all the escape plans he had contrived.

But the enigma he faced was undiminished. When first he was captured he thought the aliens were simply too busy to torture or kill him and that this was why he had been left alone, paralyzed and miserable, for days at a time.

Later, when hunger and thirst threatened to drive him mad he had begun to believe that was the alien concept of diabolical torture; that they might be secretly watching him suffer. At the time, he struggled to appreciate this supposed cerebral style of sadism, persuading himself that it might be worthwhile trying on some of his own enemies if he got out of this alive. It had struck him as so perverse that it was enviable.

Now he realized it almost certainly hadn't been deliberate, intentional torture, but only simple ignorance and neglect, by aliens who quite naturally had their own priorities and their own preferred methods of doing things.

Coincidences had deceived him. To Calhoun their expedient pumping of water through his paralyzed lips until he threw up seemed designed only to keep him alive and prolong his agony. When they began force-feeding him those mushy, disgusting, foul-tasting pastes and then turned him loose in a small, doorless cell he reasoned he must so amuse them that they were saving him for some special occasion.

Until he looked "outside" at this surrealistic scene, that might have been something out of Dante's Inferno, he had believed his travail merely prelude to a main event. He had considered the supposition proven when only minutes ago the cell door had opened and the alien on the other side made a startlingly human-like gesture. Its pudgy index finger curled in a motion for Calhoun to follow it down the corridor. Calhoun was convinced he was walking that last mile.

I still might be, he thought. Now though, he doubted it was imminent.

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The alien had not seemed to move with any urgency. There was no waiting crowd, there were no guards, and he could see no stadium.

He relaxed a little and gawked around. What amazed him most was that he had been transported here with absolutely no sensation of motion over all these weeks. He knew it had been a long journey because his beard had grown full and bushy.

But leisurely sightseeing apparently did not fit in with the aliens' plans. For the first time, one of them displayed impatience with Calhoun by prodding him along.

Calhoun did, noting that this alien and all the others he could see no longer wore face masks. There was something different between the human and the alien habitats. Here, Calhoun needed the helmet and cloak and these creatures didn't, but on Earth it was the other way around. He concluded this world was home to them.

He intended to collect much more information on his surroundings from now on. He was disappointed. The aliens immediately placed him in what turned out to be a conveyance despite its lack of wheels. He was whisked off, to his everlasting disgust, to another cell. He had still not learned his fate.

For a long time after that Calhoun was alone. The cell had water, which tasted foul to him, but he was not fed. Now, though, he did not worry. He thought they would eventually get around to this. Letting him starve to death would defeat whatever purpose they had in bringing him here.

Having time to spare, Orville now speculated endlessly. He discovered that every possibility which occurred to him contained some flaw, except for punishment. That hypothesis made the most sense. He was imprisoned. He was not comfortable. He might easily spend the rest of his natural life in this cell. That was punishment.

In time he became reconciled, if not comfortable, with that theory, but it seemed that this guess too, was wrong.

The alien explained, in English far more perfect than his own, the day it popped into his cell to talk to him.

"It is time for you to leave," it said. "Put on your helmet and your garment, and follow me."

Calhoun did it. Somehow the time did not seem right for questions. He would wait and see what happened next. He knew too little now to formulate any strategy.

They walked and walked, down long corridors and past many other aliens. These greeted the sight with mixed responses. Some stopped what they were doing and gawked. Most did not, and simply ignored the swaddled human.

In time, a door loomed ahead, clearly an outside one, since it was made of transparent material and traffic could be seen moving past on the street in front of it.

Calhoun reached it and stopped; it did not open and he did not know what else to do.

The alien shouted at it and it opened. It was a powered door, quite appropriate for a prison.

"Leave," said the alien. It gestured. "You can no longer stay here."

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"You're releasing me?"

"Within limits, yes."

Now Calhoun was really frightened. He had a feeling that what had gone before was only a preliminary but that now his punishment had begun in earnest. The time for serious questions had come.

"I don't understand," he protested. "I know this is not Earth. How am I going to get home?"

"Any way you can, if you can. I doubt that will trouble you for long," the alien replied.

Calhoun hesitated, trying to think. He realized he didn't really know what to ask, so he chose what seemed an innocuous question. "Where can I go?"

"Anywhere you like," the alien replied, somewhat impatiently.

"Do you mean that?" Calhoun really smelled a rat. "Including Earth?"

"If you can find the means, yes."

"But that requires a ship. I don't have one. If I did, I don't know the way back, or how to fly a spaceship."

"That is a pity," the alien answered. "Go!"

"Wait a minute." Calhoun risked angering the alien by balking but he needed information and he doubted that very many other aliens spoke English. The time to learn was now. "You can't just throw me out without telling me why you're treating me this way. . . . "

"Correct. So I will tell you. We are throwing you out because you are a murderer."

"This is my punishment?"

"You could say that, I suppose," the alien replied. "Though actually any physical punishment is up to your victim's kinsmen, if they choose to inflict any. We have notified them that you will be at large. If they do in fact come for you they alone will decide what this will be, and they will administer it. This is their right. It was the custom of our primitive ancestors."

"That's insane. I didn't murder him. He attacked me. He had a weapon. He was trying to kill me. I had a right to defend myself."

"He had no weapon. He could hardly see you. What he carried was a light—what your people call a flashlight. We see a different part of the electromagnetic spectrum, the ultraviolet. Your single sun is feeble even when visible. When it sets we need artificial light in order to see."

"Then he should have said so—he should have explained. You certainly aren't having any trouble."

"That's because I'm a specialist. I've spent years studying your culture and I understand it. But only a few of us can speak a human language and he was not one of them. Besides, you gave him no opportunity to explain. You simply cut him down. That was murder, even by the standard of your race. You should know that, since you claim expertise in such matters."

Calhoun started to complain, then stopped, when suddenly it occurred to him that this alien was right. He was a lawyer, though to be honest with himself, not a very good one. In a situation this tight, guile might get him farther than dueling with the dead alien's kinsmen.

"Are you telling me that wager of law is permitted?"

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"I do not recognize the term, but then even I do not completely understand your culture."

"Trial by combat—ever hear of that? Humans used to do that, long ago. If the accused won he went free. Is that the idea?"

"More or less," the alien answered, after a short hesitation.

"I see. Well now, how about giving me back my gun?"

"We do not have it. It remains at the scene of your crime."

"What? How can I fight them without it?"

"Get another weapon."

"How, if I can't even talk to you people?"

"That is your problem. Find ways. We don't use money so you can't buy a weapon, but you could steal one, or steal something to trade for one. We know you can steal. Your own people have accused you of that on more than one occasion."

Despite the circumstances Calhoun was momentarily embarrassed. He did have a fairly extensive criminal record, mostly drug-related, but he had once been prosecuted for finding some automobile parts that weren't lost. "How do you know I do?"

"We've been visiting Earth for a long time. It seemed wise to us to be very wary with your kind so we learned all we could about you. Before the Internet such things were more difficult. Now, we surf with the best of them so gathering information is easy. Technologically, we are a century or more beyond you. Just before we brought you here we hacked into the Texas DPS network. We got not only records, but comments. One commentator remarked that you were 'nuts'; that you always wore black because you fantasized you were Pat Garrett."

"That's a lie. I just like black suits."

"The role suits you. Garrett was quite an unsavory person even though he wasn't a Texas lawyer."

Calhoun glared at the alien for a moment.

The alien demonstrated how well informed he really was. "Your behavior has precedent. After all, John Wesley Hardin was a member of the Texas Bar, wasn't he? How many people did he kill?"

"I don't know," Calhoun replied. He had to admit this alien knew his history.

But the alien also seemed to be falling right into the spirit of the discussion, and that was good because the longer Orville could keep him talking the more he would learn and the better his chances would become. He was already groping for a thread of logic. It had occurred to him that the alien's acquaintance with Earthly law represented an opportunity and he wanted a way to exploit it. Suddenly, he had it.

"You can't try me," he announced smugly. "You had no right to kidnap me and bring me here. I didn't commit any crime here. Only the State of Texas has a right to charge me because everything happened back there."

For a moment the alien was silent. Clearly, it was thinking. Calhoun could only hope that it knew and understood the concept of jurisdiction.

When the alien did speak, it did so

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with a tone Calhoun hoped was abashment. "We have you, we can do as we wish."

"Yours is an immoral race, then," Calhoun chided. "You criticize me. How are you better?"

"You have needlessly taken a life. That is a crime everywhere."

"Maybe so, but that is not the point. The question is not what happened but who has the right to complain about it. Your people were on Earth illegally. You say you respect our law? That isn't true. Our law forbids aliens to enter our country without permission. You violated our sovereignty by being there. Now you want to violate it some more by trying me under your system. What kind of hypocrites are you people?"

"Our purpose is benevolent," the alien replied. "We are studying a spatial anomaly that may be part of one of the rarest phenomena in the universe, a stargate resident on a planetary surface. If we are right you humans are a fortunate people."

"And your people came to steal it, right?"

Calhoun waited. Inwardly, he was sneering. If the aliens were stupid enough to fall for that line he was on the way out. He could tell the alien was bothered by what he had just said but that he was not quite sold. Calhoun unleashed another salvo. "We have an old saying," he told the alien. "Might does not make right."

"Perhaps not," the alien replied. "But might does make rights. I admit the distinction is subtle but it is nevertheless very real. Realistically, were we to return you to Earth and surrender you to the state of Texas for trial, that trial would be farcical."

The alien paused. "Yes, we know about that, too. There, you will be among your own kind, and your kind deal in drugs and political corruption. Lies, deceit, bribery, extortion, everything that is reprehensible to a truly moral society you and your allies see as the tools of a trade. You use them to destroy the lives of those who crave addictive substances. It is you who are the hypocrite."

Again, the alien paused and pondered.

Calhoun became concerned. For a while there, he had been on a roll, and beginning to believe the technique of playing to the alien's ethics had a chance of success. Now, he wasn't so sure. It needed work, more stark, rigid logic, the kind this one was demonstrating his species found difficult to resist. "It is still my right to be tried there," he argued, "if at all, and tried under the law of the forum, not by some alien code with which I have no acquaintance."

Calhoun gazed into the alien's face. He could, of course, recognize no meaningful expression; still, the alien's hesitation was encouraging. Perhaps it was time for a little fine tuning. A good con-man, and he saw himself as one of these, knew when to set the hook. "When you do come out of the closet, how can you expect my people to trust you?"

The alien paused only a moment longer, then he pointed down the corridor and said, "Return to your cell. Though you represent the worst we have ever encountered on your world,

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there still is some logic in what you say. I will consult with our leadership. If they agree with you, and if your victim's kinsmen consent, perhaps we can reach an accommodation."

Life in the cell was no more pleasant than it ever had been but Calhoun had no other choice. Theoretically, he did not have to stay. He could wander the planet at will, but only here would the aliens guarantee his safety and provide the necessities of life. Without knowledge of the language or customs, without friends, without any useful skills, he was ill-equipped to roam a world that used no money, especially when he was also a lawful prey animal for the dead alien's relatives.

The wait was tedious, and lasted nearly a week by Calhoun's reckoning. But when it was over he believed it had been worth every second. The alien spokesman arrived in his cell one morning just as he awoke, accompanied by a delegation he was confident represented the local criminal justice mechanism.

"They bring a proposition," the alien told him. "I will translate."

Calhoun nodded his assent, then added, "Let's hear it."

There was a long discourse in the alien language, then the spokesman turned and said, "They will agree in principle that you should be tried under the law you know, since your intent derived from your experience with that law."

"Then, you'll take me back?"

"No. We will not do that. We know much about that region. Even your locals call it 'Occupied Texas' because of the corruption the drug trade generates. These people are your allies. You would simply buy your way out of this. You are effectively immune from your own law."

Calhoun was afraid to ask the next logical question but the alien anticipated his consternation and answered it anyhow. "We will try you here. We will convene a court as nearly identical to the Earth ideal as possible. Its personnel will learn your language and your law. We will access your statutes and learned treatises. We will reproduce the body of precedent. We will conform in all respects but one to the court you have at home."

"And what does that mean?" Calhoun asked, in an embarrassingly squeaky voice.

"The presiding judge will be honest."

Calhoun winced.

"Do you have an objection?"

Actually, Calhoun did. Back in West Texas he had never worried much about such things because the alien was right, everybody in law enforcement was for sale. But he decided it didn't matter, at least not at the moment. The important thing was to suck the aliens into the goody-goody trap, then crucify them on the cross of their own collective conscience. Calhoun was good at things like that, they were his stock in trade. Even so, though he usually did win his cases by doing precisely what the alien claimed he was confident he could win even with an honest judge because he knew a couple of things the aliens didn't.

So, just before his silence threatened to provoke the alien into

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prompting him, Calhoun answered, "I guess not."

"Is that a 'yes' or a 'no'?"

"No!"

"What?"

"Negative," Calhoun screamed.

The rest of the session went swiftly, and when it was over Calhoun felt satisfied that after a few more weeks he'd be in complete control. He began to plan beyond his trial. When it was over, and he was back on Earth, when he was the only human on the planet who knew about the aliens, he would use his knowledge and experience to move into the big time. It was even possible, he believed, that something on Earth would have addictive effects on this life form. What a coup that would be, if he could turn his current prison into a whole world of junkies!

He waited patiently and with a comfortable anticipation.

"I agree, Your Honor, it's a technicality, but if you check the statute you'll find it really is the law of Texas. Look at Texas Penal Code Section 19.02."

"I see it. So?"

"To be murder, the accused must cause the death of an 'individual.'"

"Go on."

"Next, check P.C., Section 107(a)(17). 'Individual means a human being who has been born and is alive.' You will agree, it does say that, and that this is the law of Texas?"

"That is what it says, Mr. Calhoun. What is your point?"

"Well—judge, isn't it obvious? I mean, look at you people. You're not human beings and neither was the deceased. You have no choice, you have to grant my motion to dismiss the charge."

Calhoun smirked. He watched the alien judge, struggling with the point, squirming and uncomfortable to begin with in the unaccustomed confines of the human-style robe. "I've got 'em!" He subvocalized.

But the judge wasn't quite ready to rule. He turned to the alien DA. "Do you wish to respond, Mr. Prosecutor?"

"Yes, Your Honor. And I must admit I am quite resentful of my opponent's assertion that I am not a human being. I am as much entitled to claim that status as he is."

Immediately, Calhoun was on his feet, objecting. "Counsel misstates the law, Your Honor. Human being is a human term, applied exclusively to my race. As any fool can plainly see the prosecutor and I are entirely different organisms and completely unrelated. If he says different let him cite some authority." Calhoun sat down, confident the prosecutor couldn't top that one.

"I have already researched the law on the point, Your Honor. As my opponent well knows there is no statutory definition of the term. We must therefore, revert to the Texas Government code, specifically, section 311.011, to which P.C. Section 1.05 refers us. Section 311.011 says, 'Words and phrases shall be read in context and construed according to the rules of grammar and common usage, unless,' it goes on, 'they have acquired a technical or particular meaning, by legislative definition or otherwise.'

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"I believe my opponent will have to concede the latter is not true, and as to the former I suggest to the court that the term means any sentient being, as opposed to animals who lack reason. In any event, the Earthians to this day have never known any other sentients, so human languages lack another usage for the term. It is, at worst, a case of first impression."

"Mr. Calhoun?"

"The argument is absurd, Your Honor, he— "

"Cite me some precedent, Mr. Calhoun."

But Calhoun couldn't think of anything. Deep down, he knew this argument was lost. The Texas law was still with him on another capital point, though, self-defense, if it came to that, if they made it past Batson. There he had ample precedent. And, he chuckled, Luck would be with him. That was, he noted, quite a pun, *Luck v. State,* 588 SW2d 371, Tex. Cr. App., 1979, the leading case on the Texas Law of self-defense. And with Luck on his side, Calhoun believed, he had it greased. So, he made no further argument. When trial time arrived he would fire his next salvo. That would sink them, of that he was absolutely confident. He almost felt sorry for the prosecutor.

"Very well," the judge said, "the motion is denied. Do either of you have anything further?" When nobody answered the court adjourned.

"Bailiff, bring in the jury panel."

Calhoun watched as the alien bailiff obediently trotted out of the courtroom. He had to admit the aliens had the routine down pat. They must have worked their pointy little heads to the bone to do it.

The bailiff opened the door again, and the panel began waddling in. Calhoun had been on this world long enough so that they no longer all looked alike to him. He could tell many individuals apart through physical variations. They seemed to differ as widely as humans did.

When the panel was seated in the jury box the judge began his preliminary questioning, in English, and the panel answered in English. Calhoun was astonished. The aliens had worked even harder than he thought. It was too bad it would all be for nothing.

When the judge was finished, and was ready to turn them over to the prosecution for voir dire, Calhoun's pulse quickened. Now he would make his big move, and blow the DA right out of the water. He stood. "Your honor, I object to this entire panel."

"State your grounds, Counsel."

"The 6th amendment of the US Constitution, Your Honor. My right is not merely to trial by jury but to trial by a jury of my peers. There is a similar guarantee made in the Texas Constitution, and in Article 1.12 of the Texas Code of Criminal Procedure. This is purposeful discrimination. These people are not my peers." He sat down. He felt smug. If the DA squawked he'd throw *Batson v. Kentucky* at him.

"Mr. Prosecutor?"

"Not my doing, Your Honor. The clerk followed the Texas law to the letter in selecting them. I had nothing to do with it. The accused waived in-

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dictment so the problem didn't come up with the grand jury."

"Mr. Calhoun?"

Calhoun stood, ready with a pat answer. He'd waived indictment specifically so the question wouldn't arise. He wanted to spring this on the aliens cold, renew his motion for dismissal and get out of here. As he saw it, the aliens had no other choice unless they were willing to compromise their principles and kidnap enough humans to make up a panel. He was sure they wouldn't do that. He decided this was the time to pounce. "Your Honor, I—"

"Just who do you consider your peers to be, Mr. Calhoun?"

Calhoun was annoyed at the interruption, nevertheless he kept his cool. "Why, people like me, Your Honor. Earth people, with the experience and emotions and habits of my own kind."

"I see. The closer they come to your own personality and the more closely they resemble you the better?"

"Y-yeah, that's about it." Something about this discourse suddenly gave Calhoun the jitters. The judge was taking it all too calmly. This guy was up to something. Unfortunately, Calhoun had no idea what.

"You would not object to people who met these qualifications?"

"I didn't say that. There might be other reasons why they weren't suitable." He paused, then added. "There are grounds that apply even in human courts, you know."

"People who knew you and didn't like you, perhaps? People who hated lawyers as a class? People like that?"

"Yes. People like that."

"It sounds like you're saying that your ideal peers would be twelve lawyers, just like you, Mr. Calhoun, people with precisely the same experiences in life as you've had. People with the same background, the same drives, the same personalities?"

"Well, uh, theoretically I don't suppose I could object to that, but then you couldn't find twelve people like that even on Earth."

"We'd have to compromise, would we?"

"Well, sure."

"Earth courts can't be super-picky, either, then?"

Now Calhoun was sure he was being baited, he just didn't know how. He stalled as long as he could and then he answered, "No."

"All right," the judge replied. He turned to the bailiff. "Bring in the next panel."

The bailiff disappeared for tense moments. When he returned twelve new jurors followed him into the courtroom, past a stunned and speechless Calhoun. Calhoun's lower jaw still rested against his chest when they were seated.

"Well, Mr. Calhoun, what do you think of this panel?"

"Mr. Calhoun? Mr. Calhoun, are you all right?"

"Uh—fine, Your Honor." Calhoun reached his hand up to wipe his mouth. Calhoun was drooling. He gazed at the figures in the jury box, twelve identical human forms, each dressed in a black suit with a string bow tie, each, as far as he could discern, absolutely identical to himself. How the aliens had accomplished this

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he did not know, but, if the identification was as close in other respects they had wasted their time. The case was over. This was indeed a jury of his peers. These jurors would understand him as no others ever could. They would relate to him, sympathize with him. *They* would never condemn him.

"You may begin your voir dire, Mr. Prosecutor," the judge announced solemnly.

Calhoun huddled in the hollow between two huge boulders, the folds of his tattered robe gathered around him against the chill of the wind. He longed for peaceful sleep but in this season the wind was as constant as the light of the three suns. Of all the things he'd left on Earth the night was what Calhoun missed most. Night had been his friend, concealing his secrets from prying eyes.

He would never see Earth again. That was his punishment. That and endless wandering over this alien world. "We misled you. We have not executed anyone within historical times. No survivor has exercised his right of revenge in more than a terrestrial millennium," the judge had announced when he passed sentence.

"Death is not the punishment that life is. We have insured that you will have ample time to repent. We have cleansed your body of all its resident viri. Microbes which evolved among us cannot harm you; consequently, though you are not immortal, you may expect to live an extraordinarily long time. While you live our entire society will share the vengeance of your victim's kinsmen."

That, Calhoun soon learned, was literally true. Though he wandered where he would and no one harmed him, neither did they help him. No one spoke to him. No one gave him food, or water, or shelter. Wherever he went they were ready, and shut themselves up inside their houses until he was gone. If he tried to take something that belonged to them they simply took it back. There were always enough of them so that he was easily overpowered without any serious injury. It was maddening.

Worse, he had only himself to blame—literally. Having anticipated his demand and puzzled out his strategy the wary aliens had sprung their trap. It was an ingenious one, and he hadn't seen the flaw in his reasoning until it was far too late.

Twelve cloned copies of him, twelve exact alter egos, copies of Calhoun correct in every essential detail, including his most minute memories, impressed upon them by some arcane means yet beyond the science of Earth. They were short-lived. They would survive only a couple of terrestrial years, but they had not been told this.

Calhoun had been allowed to test them during voir dire, and satisfy himself that up to the very moment of their creation these were absolutely identical. And then he took the bait.

In hindsight, he realized he should have been alerted by the prosecutor's failure to object, and the court's observation that in ancient English law, where the jury system had originated, acquaintance with the accused had initially been mandatory for jurors.

Something stirred to his right. He

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caught it in his peripheral vision. He was suddenly distracted by his ever-present hunger. Here on this accursed world he seemed always to just barely get enough nourishment to keep himself alive but never enough to satisfy the gnawing.

In a moment he had confirmed, this was an "edible," a creeping repulsive-looking creature slow enough and stupid enough to be caught with the bare hands and that would yield a mouthful or two of foul-tasting protein and moisture.

Calhoun stalked it carefully, and at the propitious moment pounced. He gobbled it up without relish, then returned to his meager shelter between the rocks, back to the memory of his most monumental miscalculation.

The memory was vivid. Even now, years later, the fallacy still exerted a fatal attraction.

It had been a moment of elation. How could it miss? It was every defendant's dream, to be judged if he must be judged, by himself.

But they were too closely identical. Aside from their abbreviated lifespans, which the aliens had built into them, they shared all of Calhoun's failings and foibles. Calhoun supposed that this absolute identity would make them kindred, and in a way, he had guessed right. But the kinship was perverse.

Instead of empathizing with him, each of them—as greedy, ruthless and ambitious as their prime—had expected to compete with the others for what Calhoun had left behind on Earth.

Calhoun assumed that they would instantly vote to acquit him. That way all would be returned to Earth.

They reasoned that by voting him guilty each would have one less competitor for the spoils. As prisoners of the Calhoun psyche they could choose no other course.

He never knew, of course, whether or not the aliens had ever transported the copies to Earth. He assumed that if they had, the copies had died of old age within days of arrival, as their preprogrammed lives ran out.

He would liked to have watched this happen, to enjoy their shock at the realization that they too had been beguiled and betrayed. Though quite literally they were he, and he was they, he felt no sympathy for them. There is no honor among thieves, nor any love either. ■

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THE ALTERNATE VIEW Jeffery D. Kooistra

BIG ROCKS

(Editor's Note: rather than leaving The Alternate View empty while we continue to investigate a dispute involving G. Harry Stine's February 1997 column, this month we offer a guest column by an author well known to Analog*'s readers.)*

A while back PBS telecast several NOVA episodes dealing with the moving and erecting of large stones in ancient times, the sort of thing ancient builders did often and seemingly easily. The shows brought together modern-day researchers and showed them testing out their own ideas for how the builders might have done it. One show dealt with putting up a replica of one of the big stone uprights of Stonehenge. Another considered ways the Egyptians might have used to stand up their huge obelisks.

This essay was prompted by a comment made in the obelisk episode, a comment easy to miss. The narrator pointed out that the 40-ton stone being moved in the show required 200 men to get it going, so a 400-ton obelisk would require 2,000 men. In other words, a tenfold increase in weight would require a tenfold increase in the number of guys needed to drag it around (dragging it on the ground was assumed).

This may seem reasonable, but as a general principle it's nonsense, the reason being that there is nothing linear about friction. Certainly not in this case.

Consider a three-ton stone cube, a yard on each side. (By the way, this is a good way to estimate the weight of big rocks—one cubic yard of a typical stone weighs about three tons.) The contact pressure between it and the ground is three tons per square yard. Double all the dimensions. Now you have a 24-ton stone setting on a four-square-yard base for a contact pressure of six tons per square yard. Conversely, this increase in pressure means a reduction in surface contact area per ton of weight.

Here's the question: If you want to drag a stone, is it better to have a relatively high contact pressure and low contact area, or relatively low pressure and a large contact area?

I did a quick experiment in the basement to test this. Using two con-

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crete blocks, I first tied them together end to end and measured the force needed to get them started moving (the large contact area/low pressure situation). Next, I stacked one atop the other and repeated the experiment. It took more force to get the stack moving than in the end-to-end case.

Well, that's how it worked in my basement with smooth concrete blocks on a smooth concrete floor. I don't know what would have happened if I'd thrown sand on the floor, or if I'd taken my blocks to a muddy field, or perhaps a gravel driveway. The stacked situation might have become the less demanding of the two under different conditions. I also had no way to measure needed force once the blocks were actually in motion, which is an entirely different matter from the initially static situation. (You *Analog* readers with your own basements and driveways might also want to get into the act—experimental archeology is wide open for laymen to make valuable contributions.)

This is just the beginning of thinking about these matters. There isn't a good "physics of dirt" worked out with respect to dragging things around on it. Why would we need one? We've been using the wheel for thousands of years. The interrelationships among shapes and masses of stones and landscape across which one wishes to move these stones isn't worked out at all.

This question of big stone moving must often be solved in archeology from the armchair, it generally being inconvenient to actually conduct experiments. (Putting together TV shows like the NOVA episodes are about the only times techniques are tested concerning large ancient building projects, but no one ever gets enough time to perfect the techniques.) The usual argument goes like this: Big stones were moved in the past, oftentimes stones weighing several hundred tons. These were moved with primitive technology. The most primitive technology is guys with ropes. Therefore, all big stone moving was done by guys with ropes, and with bigger stones, more guys with ropes were needed. (Enthusiasm for the task is also sometimes invoked, although there is no data on how much additional wattage "enthusiasm" contributes to a task.)

Like the comment about ten times the guys for ten times the weight, this "most primitive" idea is almost certainly untrue. I think such views are invoked with little understanding of the engineering mind.

Case in point: In the Stonehenge show, the engineer involved in the project (he wasn't a "real" archeologist) was criticized for devising a very clever counterweight method to tip the 40-ton stone (they crafted a replica out of concrete) into its support hole. He built a wooden rail atop the horizontal stone, and put a heavy stone weight upon it near the center. Then all that was needed was to have a few people slide the counterweight toward the bottom end and the upright levered up and dropped into place most gloriously. It was argued (before it worked!) that this was a typical overengineered, modern-day approach.

Now wait just one darn minute.

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We often hear that the more we study the people of the past, the more they seem just like us. They lied, cheated, and killed for money or pleasure. They also fell in love, died for love of country, composed poetry, and wrote letters home from the front. The idea that the ancient engineers in charge of moving and emplacing big stones would be different from engineers today, and would settle for a first cut at the problem solution, like guys with ropes, is ridiculous. With practice and time to think, the ancient engineers would have devised more clever techniques.

I suggest that archeologists should *always* assume that ancient engineers were as clever as ours (barring contemporaneous records indicating otherwise), and thus, that any machine one could build out of local materials likely *was* built if it would help the job along.

Let's return to the Stonehenge show. The engineer never did try moving the 40-ton stone by dragging it on the ground. He didn't have the people available. (The "more guys with ropes" idea always assumes plentiful human labor.) Instead, he built a set of tracks out of timber which were then greased (ancients could have used animal fat), and it was relatively easy for 130 people or so to get it moving. It is true there is scant evidence of tracks ever having been built. But how much of a wooden track system could one expect to survive after 4,000 years, particularly after the forest surrounding Stonehenge had been felled and wood was in shorter supply? And the surrounding fields had been plowed for millennia? I think he had the right idea, that the builders made clever use of materials at hand to save effort rather than just relying on brute strength.

What sorts of things do we do today if we need to routinely move something heavier than we can move alone or by hand? You boat owners are well acquainted with the simple hand crank, with which one can winch a heavy boat out of the water and onto a trailer. It would have been nothing more than a simple application of cleverness and local materials for the Stonehenge crew to have built a number of portable capstans (vertically mounted cranks) out of wood which could have been pulled around on sledges, weighted down with stones, or staked, or lashed to trees to fix them in place, then cranked by a few men to pull with the force of many.

"Specialized" equipment of even this slight complexity is seldom accepted by the archeological community as a solution to some of the puzzles of ancient construction techniques, particularly those puzzles not associated with great empires. It's all ramps, ropes, and sweat. Archeologists sometimes protest the idea by pointing out that we haven't dug up any evidence that the Stonehenge builders used such devices. Well so what? Why should we expect to? The Stonehenge culture had a name for itself, but we don't know what it was. We don't know why they built Stonehenge. We do know that it was a significant

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achievement in construction, one requiring a great deal of cleverness from its engineers to accomplish. This by itself precludes them from being fool enough to settle for more guys with ropes when capstans (which would have allowed for much finer control) or something else could have been built to complete the job more efficiently. And considering the available construction materials, the wood used to build the machines would have been burned or rotted away long ago, and any parts fashioned out of bronze or copper would have been melted down and recycled.

The ancients faced the same money and energy considerations we do. More workers means more expenditure on food and shelter, and fewer available to farm or hunt. In old times the builders would have been driven to invent labor-saving methods for the same reason we use a steam shovel for big holes rather than a thousand guys with shovels. Necessity has always been the mother of invention, even thousands of years ago.

Also, note that even today special equipment built to accomplish a specific task doesn't stick around long. Much of the equipment we used to go to the Moon has long since been recycled or lies rusting in junkyards. Even the huge crawlers used to bring the Saturn 5s out to the launch pad will go the way of the dinosaurs once the Shuttle program is over and space travel becomes routine. Even in Europe the last vestiges of World War Two equipment are returning to the dust.

Of course, megalithic construction (building with big stones) was anything but rare millennia ago. Great Britain is covered with stone circles and monuments and enclosures. The Mediterranean island of Malta has stone structures on it that were thousands of years old before the first pyramid went up. The sheer volume of stone work argues for efficiency and perfection of technique.

The capstan idea for Stonehenge would have worked well. So too would have the methods tested out by the engineer, given some extra practice. But those stones only weighed in at about 40 tons. There are some 400-ton monster stones at a place called Puma Punku near Tiahuanaco, and I don't know whether any kind of wooden machine could have been used to drag them into place. And at a place called Ba'albek in Lebanon are some 800-ton stones lifted and positioned in the walls of a temple.

Simple technology or modern day, working with stones of such size is extremely difficult to do.

Which brings up the real mystery to me. Why? Why would the ancients build with such huge stones, which we with even 20th-century technology would find a daunting task, when smaller stones would suffice? Moving and positioning one 100-ton rock is much more difficult than moving and positioning ten 10-ton stones, and it's not as if the ancients weren't also building with smaller stones anyway.

To date, we don't know why. We've barely even asked the question. ■

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Probability Zero

Marc Stiegler

A Brief History of (Eat Chippos Now!) Intellectual Property

In Man's Original State Of Nature, there was, of course, **(Fly Ford-Hansa!)** no such thing as "intellectual property." Copyright simply did not exist. If someone laboriously carved out a novel on a stone tablet, anyone with a Stone Copier could make duplicates and hand them out as he wished **(Orion Starships—simply the best!)**. Of course, Stone Copiers were rare and expensive, and truth be told, the cost of the carving was actually greater than the cost of creating the intellectual value embodied in the story. Early storytellers had to be experts at carving; the storytelling itself was a secondary talent **(Keletra molycircs, highest P ratings at the lowest prices!)**.

The invention of the printing press changed this. Suddenly the actual writing was worth more than the manufacture of the reading material. Duplicating became possible for piracy professionals: purchase a printing machine and you were in business. In order to protect the profitability of the writer's guild, something had to be done **(Advertise In Romance Literature For High Returns!)**. Thus "intellectual property" was born.

Mankind struggled with the concept of intellectual property for several centuries. Clearly, substantial public good could be provided by allowing free duplication of knowledge; on the other hand, creators of intellectual value quickly lost interest in continued production if they could not be reimbursed reasonably for their efforts. The creators kept the upper hand, with the peak of their power embodied in the Bern Convention, to which **(Snacky Do's are Sweetest in Twos!)** all major countries in the world belonged by the 1990s.

Even as the Bern Convention spread its dominion across the planet, however, obsolescence crept up on the entire concept. As people from around the globe wired into the inter-

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net, and particularly the World Wide Web, where social forces (a convention for allowing people to copy your work), technological forces (both the ease of copying and the difficulty of creating a secure financial transaction), and political forces (the classification of serious encryption software as "a munition" in the United States, to ensure that politicians and their friends could read your private messages, but only if they wanted to) made payment for intellectual property well nigh impossible.

At last the market found the solution in April of 1996. In that glorious month, Yahoo! Incorporated held a wildly successful Initial Public Offering, based on a business model in which they would supply valuable intellectual property for free, **(Buy Bonds The Yonds Way!)** with revenue being generated via advertising. Advertising had existed before, but none prior to this time had realized what a perfect solution it was to the incipient crisis.

The plan caught on like wildfire. Soon all forms of intellectual property were being funded by advertising. **(Marsco Nuclear Engine Overhauls Boost Your Pep!)** This led inevitably to the elimination of all copyright, patent, and other "intellectual property" laws by the middle of the 21st century. **(You'll love Caty's Positronic RoboServants!)** Mankind has solved the **(Seductress Perfume fits your mood!) (Accidentally engineered a retrovirus? Let MedSolvers clean up!)** problem of **(Programming for New Dollars—Javula++ with FutureTeck Compilers!)** reimbursement for **(Enter that second hundred years comfortably with MemFlex Editing!)** knowledge workers **(Convert Your Asteroidal Second Home Into a Money Maker—call Refabs Unlimited now!)** forever. ■

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Paul Levinson

ADVANTAGE, BELLARMINE

Ever wonder why Galileo really caved in to the Church?

Roberto Francesco Romolo Bellarmine—*consultor* of the Holy Office, head of the Roman College, Cardinal, former Archbishop of Capua—turned to his guest with a weary smile. "So, Maffeo, any words of wisdom about Galileo? He'll be in Rome next week, and we have arranged a visit."

Maffeo Barberini, scion of one of the wealthiest, most powerful families in Italy, a Cardinal too—one day to be Pope, Bellarmine was sure—removed a grape pit from his tongue. "Only what you already know—he is right."

"Pity more of our people cannot grasp that," Bellarmine said. "The nonsense that has been produced in our own College—that the Moon is really pure, perfect, sublimely spherical as Aristotle held, and the mountains and craters seen through Galileo's telescope are but imperfections far below that heavenly invisible surface—you would think it was 615 not 1615, and Rome had just been sacked of all common sense, all reason!"

"Ah, yes." Barberini chuckled. "And, as I recall, Galileo had a good answer to that one: if we accept that heavenly surfaces are invisible, then we could just as easily agree that the real surface of the Moon, constructed of that same magical substance, actually rises in towering mountains ten times *higher* than his telescope has seen."

"He is clever," Bellarmine said, unsmiling. "And that is what makes him dangerous. I have tried to convey to him the thought, the path, that his mathematics, his observations, may be right—that we may welcome them, rejoice in them, as an improvement over Ptolemy's epicycles—but

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that the underlying, everlasting truth is just as it ever was."

"And what truth is that?" Barberini asked.

"That is no doubt the question that troubles Galileo," Bellarmine replied, "and why he sometimes gives the appearance of accepting our arguments, yet in his truest soul rejects them. It is because we ourselves are unsure of just what the underlying, everlasting truth really is."

"As we have good reason to be," Barberini said. "But that is our burden—not the world's. And part of our burden is to keep the world—not only the physical world, but the souls of its people—stable."

"Which brings us back to the problem of Galileo," Bellarmine said, sadly. "His theories, his publications, presented to the world without our mediation, cannot help but sow confusion in the common soul."

"Have you implied to him anything at all of the Instruments?" Barberini asked, as delicately as he could manage.

"No! I have not! Therein lies the road that was taken with Giordano Bruno. And it did no good—it did worse than no good. In the end . . ." Bellarmine could not bring himself to finish.

"In the end, our Holy Church had to kill him," Barberini said. "Still, the result need not be the same with Galileo. He is a different kind of man—more practical, more of a scientist than a mystic like Bruno. He may see a different kind of lesson in the Instruments."

"No," Bellarmine insisted. "I will not have it."

Barberini permitted himself the slightest of smiles.

"You are a stubborn man," Bellarmine said to Galileo.

"Stubbornness has nothing to do with this, Your Eminence," Galileo replied. "Truth is what this is about. I can say 'the Earth does not move,' as easily as the next man. But if, in truth, the Earth does move, then it matters not what I say. For in time others will make the same observations as I, and they will say that the Earth does move. And where will our Holy Church be then?"

"You are stubborn because you assume that future telescopes, perhaps with power far greater than yours, will see the same things in the heavens as your device," Bellarmine answered. "How can you be sure of that?"

"I am not sure of that," Galileo said. "Devices change, and so then does the knowledge they produce."

"Precisely," Bellarmine said. "The only thing constant in this world is the Lord's word, and the only constant path towards that is the Church's teaching."

"Yes, but if device A contradicts the Church's teaching, then even though it may be improved upon at some future time by device B, then ought we not at least consider the evidence of device A at this time?"

Bellarmine looked away. "Devices," he said at last. "Believe me, there are more devices in this Universe than you, with or without your telescope, have ever dreamed of."

Galileo squirmed. "Are you refer-

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ring to the Instruments? Do you seek to intimidate me by intimations of your Instruments of Torture?"

Bellarmine said nothing.

"I am a weak vessel," Galileo continued. "I might well sooner lie about what I know to be true than be subjected to your torture. But what would that gain you in the end? Do you suppose you can torture the whole world—impose your will on every human eye that looks at the heavens through a lens?"

"I was hoping you might be persuaded—not by torture, but by reason itself—to see the dangers in the way you proselytize your theories," Bellarmine replied. "I was hoping that once so convinced, we might even enlist you to help in our cause—explain to the world that, although science always progresses, always changes, the soul and its place in the Universe remains constant, remains forever, and our Holy Church is the only reliable guide to that."

"Forgive me, Eminence—but I fear it's the Church that is treading on the domain of science here, not vice versa, in your insistence that the Earth is the unmoving center of the Universe. And you have no evidence that the Copernican theory, which my telescopic observations support, is wrong."

Bellarmine sighed. "Suppose I showed you evidence."

Galileo scoffed. "What, in the Holy Bible?"

"No," Bellarmine said very quietly. "In Instruments perhaps not ultimately unlike your telescope—Instruments of vision. Dangerous Instruments—far more dangerous than your telescopes." He wrung his hands. "I had hoped not to have to speak to you of this. But I see there is no other way."

Galileo shuddered. "You are speaking to me again of torture? Of burning out my eyes?"

"No, not of torture—at least, not of physical torture, I assure you," Bellarmine replied. "Please, come with me."

"We think they are a kind of illuminated manuscript," Bellarmine said. "Except, the words can be changed upon them."

Galileo stared at one of the devices, in rapt attention. "The writing appears to be Italian."

"Latin editions are also available," Bellarmine advised. "Many in vulgate as well. A few are familiar to us, most not."

"Each of these—manuscript Instruments—contains a different edition?" Galileo asked. They were three in the room.

"No," Bellarmine said. "Each Instrument contains many different editions—just as each tree contains many different leaves. But each of these Instruments appears to contain the *same* different editions."

"Ah," Galileo mused. "Such as three libraries, perhaps, each of which contains the same editions?"

Bellarmine nodded. "Yes. Perhaps."

Galileo studied the words on the glass—they were a treatise, of some sort, about Copernican theory.

"This essay talks of planets," he said. "Do these manuscripts have pictures, engravings lit from within, like

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the illumined Books of Hours?"

"Yes," Bellarmine replied. "Except these Instruments truly display a passage of time—they show pictures of things I think no man, truly, has ever seen."

Galileo's eyes lit up brighter than the manuscript. "Prester John's Speculum, come to life!"

Bellarmine made a sarcastic sound. "Prester John is an old wives' tale, designed to give hope to children. These Instruments, as you can see, are plainly real."

"Yes, yes, I see that," Galileo said, growing more and more excited as he read the text. "And this treatise has some connection to my work . . ."

"More than you realize," Bellarmine said. "Touch that emblem." He gestured to one of many little multi-colored ovals that occupied the margins of the text. This one contained a tiny, stylized arrow that pointed up. "It will cause the manuscript to scroll backward, to the beginning."

Galileo did as told. The text slowly scrolled, until it came to what was clearly a title page.

Galileo gasped.

The title read, *Dialogo sopra i due massimi sistemi del mondo*. It was indicated as published by the presses of Landini, in Florence, in the year 1632.

Its author was Galileo Galilei.

"Clever forgery!" Galileo exclaimed, half in anger, half in admiration. "So your scribes at the College seek to publish some confusing document under my name, and therein mislead the world about my real contentions!"

"I think it is not a forgery," Bellarmine said, "or, at least, something not as simple as a forgery. I think you will agree, if you read on."

But Galileo turned away from the text, and focused instead on Bellarmine. "It is a Dialog about the Two Chief World Systems, purportedly written by me, except I did not write it. Therefore, it must be a forgery."

Bellarmine shook his head no. "I think you would do better to say, not that you did not write it, but you did not write it yet."

"Preposterous," Galileo said. "How could you possibly know that?"

"Would it surprise you to know that I read your *Sidereus Nuncius*, on that very Instrument at which you have just been staring, in 1599, the year Clement VIII made me a Cardinal—a good decade before you would even make the observations with your telescope that would form the basis of that essay you published in 1610?"

"Forgive me, Eminence—that cannot be true!" But Galileo's mouth hung open.

"I assure you it is," Bellarmine said. "You see, I have been an admirer of yours—albeit secret—for quite some time. Perhaps even longer than you."

Galileo harrumphed, and looked back at the text on the Instrument.

"I grant you, of course, that there is no way I can conclusively prove what I have just told you," Bellarmine allowed, "not about seeing *Sidereus Nuncius* in 1599, eleven years before you wrote it, nor about the legitimacy of your authorship of the *Dialogo* that you see before you now, which apparently has seventeen more years before it comes into being in . . . in the out-

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side world."

"The outside world in contrast to what other world?" Galileo asked. "In contrast to this illuminated world—this, moving manuscript lit from within? What is this, then, a portal on to the Platonic world of eternal truth and verity? That world is a figment of imagination far greater than Prester's Speculum!"

Bellarmine ventured a small truth in jest. "Oh, I would say there is little chance of the information contained in the Instrument being eternally true, my friend, if you or any mortal wrote it."

Galileo looked fitfully at the text. "What other manuscripts does this Instrument contain?" He jabbed another emblem.

The text disappeared. "Oh no!"

"Do not be alarmed," Bellarmine said, and leaned over Galileo's shoulder. "At least, there is no need to be concerned about the words disappearing." He touched a third emblem. The words returned. "You see, they are easily recalled. Here," he said, gesturing to another oval. "That one makes the text proceed forward. The one underneath speeds it to the very end. You will find at the end of your text a listing of other authors whose works are within the Instrument."

Galileo touched the speed-to-the-end symbol—a miniature of Mercury, god of thievery as well as speed. Words flew upward on the screen, like souls freed from hell. Finally, a profusion of proper names settled into stability at the end of the document.

Galileo looked, muttered. "Most of these are not known to me," he said.

"Try that one," Bellarmine offered.

And his finger pointed to: Einstein.

Galileo stayed in the room with the Instruments, poring over their contents, for nine days and nights.

Bellarmine brought him food and drink and consolation.

"I think I have read enough," Galileo said at last.

"Good," Bellarmine replied. "The word outside is that we are torturing you, or have killed you, or are threatening to do one or both. It would be helpful if you could show your face and assure everyone that you are unharmed."

"But I am not unharmed," Galileo said. "My soul has been fed to the breaking point. I will never be the same."

"Ah, yes, well, this is the price we pay for knowledge, is it not? This is the price you want the whole world to pay—a world of people with intellects far feebler than yours—when you feed them your theories, your theories which you are so sure are true, about the Earth and the heavens. Except, you are not so sure any more, are you?"

"No, I am not," Galileo said, with profound fatigue.

"You need not worry for your physical being—nor even for the survival of your soul," Bellarmine said softly. "Others before you have seen these Instruments—not many, but others—and most have survived."

"Others? Who?" Galileo asked.

"Well, I told you that I first saw this sixteen years ago, and I am still here, and alive."

"Yes, but I meant—"

"I know what you meant," Bel-

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larmine said. He pondered for a moment. "Leonardo da Vinci saw these Instruments—he studied them for years—I suppose there is no harm in telling you that."

"Yes, that would make sense," Galileo said. "He is rumored to have made sketches, extraordinary, of flying devices, machines that could live under the sea. . . ."

"The rumors are true," Bellarmine said.

"But where did you get these Instruments? How long have they been here?"

"That I am unable to tell you, not because I do not want to, but because we honestly do not know," Bellarmine said. "Some say Marco Polo brought them back from Cathay. But there is no real evidence of that. The first definite record we have of them here is in 1357. The three of them. Why three? Maybe as protection in case one or two of them were lost. Who knows. The first people who read the words within could barely understand what they meant. Oh, they understood some of the Ancients. But when they came upon you—Galileo Galilei—they had as much comprehension of you as you do of Albert Einstein."

Galileo trembled. "I understood not much of Einstein—most of his mathematics is beyond me. But I grasped some of Isaac Newton, and from that vantage point, and what little of Einstein I could comprehend, I can see that my work is . . ."

Bellarmine shook his head sympathetically.

"I can see that the notion that the Sun is the center of our system is . . . is a *relative* thing, not as absolute as first I thought. We must take care not to make the same mistake with Copernicus as the world has been making for lo these fourteen centuries with Ptolemy."

"Good," Bellarmine said. "My faith in your judgment has not been misplaced."

"So much knowledge to be had here," Galileo said, rubbing his eyes and looking again at the Instrument. "Will I be permitted to return?"

"Perhaps," Bellarmine said. "We shall see."

"But our problem remains," Galileo said. "Even if I renounce what I have said, even if I publish not another word about my telescopic observations and their support of Copernicus, that will not stop others from following in the path I have started."

"We do not want you to renounce anything—not now," Bellarmine said. "Word, of course, will indeed spread about your discoveries and your theories. We know that from the Instruments. We cannot stop that. Nor do we want to. What we want is to make sure, as much as possible, that word reaches the people at the right time, in the right way—when their souls are ready to accept it."

"But how?" Galileo asked.

Bellarmine put his hand on Galileo's shoulder. "Leave the details to us. You can continue writing and publishing as you have been doing—but try to take care to make sure you distinguish between science and its explanation of appearances, and faith and its explanation of the way things truly are. In time, you will write your

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Dialogo—you have already read it, so you will have an advantage." Bellarmine smiled a beatific smile. "Who knows, perhaps some of our very discussions in the past few days will find their way into that fine book."

Galileo nodded. "Yes."

"Do not worry," Bellarmine said. "We will provide you with instructions—detailing just when you should write your treatises, just when you should appear obstinate, just when you should give in. Leave it all to us."

"Yes," Galileo said.

"A fine wine," Bellarmine said, and offered a glass to Barberini.

"And a fine day too, judging by your countenance," Barberini replied. "I take it all went well with Galileo. I told you the Instruments were the best way to proceed."

"Well, we must be aware of the deceptively easy wisdom of hindsight," Bellarmine said. "Our brethren showed Bruno the Instruments too, and his reaction was very different from Galileo's. He was uncontrollable. He had to be burned, as you know. Just a year after I had become a Cardinal. That was terrible. It should never have happened. It must never happen again."

"But you seem sure that Galileo is on the right path," Barberini said.

"Oh, I am very sure of that," Bellarmine replied.

Barberini looked at him with just the slightest quizzical expression.

"You know, our people are constantly studying the Instruments—our small, select group—trying to understand how they work, the limits of what they convey, where they might have come from," Bellarmine explained. "We have learned some things. The texts sometimes change—very slightly, but we have made records of originals, of some of the listings, and, once in a while, we notice something new, something that was not there before."

"Yes, I believe I heard of that fluctuation," Barberini said. "Almost as if events we have influence over here have some effect on the texts in the Instruments. Well, that makes sense, does it not, because we in the past are of course creating our future."

Bellarmine smiled. Barberini definitely had not only the family, and the wealth, but the intellect to be Pope.

"That is so," Bellarmine said.

"So, something in the Instruments, some change in the text, perhaps, tells you that we are on the right path with Galileo?" Barberini pressed.

"Yes," Bellarmine replied. "I checked all of the listings under my name just this morning—I do that from time to time. And I found a new one—one I am sure had not been there before."

"Yes?"

"It seems to have been authored almost 400 years from now," Bellarmine said.

"Yes?"

"It is a brief piece, in fictional form—like many of our contemporary dialogues—entitled, 'Advantage, Bellarmine.'" ■

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H.G. Stratmann

THE EUMENIDE

The question "Who's responsible?" gets much more complicated if people can really change. . . .

Illustration by Anthony Bari

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I, the mind of the past, to be driven under the ground out cast, like dirt! The wind I breathe is fury and utter hate.

—Aeschylus

"*Murderer! Baby killer!*" Her eyes blazing with rage, the woman with streaming gray hair curled her hands threateningly into claws and flew at them. Reflexively, Anna threw up her arms to protect herself. Then she remembered it was the young woman next to her who was being attacked.

Two burly policemen grabbed the gray-haired woman just as she was about to pounce on Consuelo. They wrestled the woman to the floor, avoiding the sharp fingernails flailing at their eyes, and snapped a pair of handcuffs on her.

Roy Krueger, Consuelo's lawyer, waddled out of the meeting room from which his client and Anna had just emerged. He shook his head as the officers lifted the woman to a standing position. "Damn! I knew it was a mistake to let that bitch come here! She was being too reasonable, telling me she'd just wait outside and not testify against you to the parole board!"

Krueger turned to Consuelo. "At least now we can lock her up on an assault charge, so she can't try to hurt you again—."

"No!" Consuelo shouted. She was staring at the now strangely passive woman held by the two officers. Anna noticed Consuelo was trembling. From fear? Anxiety? Hard to say—even for a psychiatrist.

Consuelo pleaded, "Let her go!"

"*What?*" Krueger stared at her, his pudgy perspiring face flushed in disbelief. "If they hadn't stopped her she'd have strangled you! If they let her go she'll try again!"

"No, she won't. She'd never hurt me. Would you?"

The gray-haired woman glared at Consuelo, and said nothing.

Consuelo turned to Anna. "Please, Dr. Young, make them let her go!"

Anna looked quizzically at Krueger, who shrugged his shoulders. She said to Consuelo, "Do you really want them to let her go? After you're released, she might try to hurt you again."

"No, she wouldn't do that. I'm sure she wouldn't!" Consuelo's words and the innocent expression on her face reflected the simple faith of a child.

Krueger frowned. "Well, if that's what you want, it's your funeral!" He nodded to the officers. The prisoner stood immobile, glaring at Consuelo, as the policemen cautiously relaxed their grip and removed her handcuffs. Slowly, defiantly, the woman raised her hands to smooth her tangled gray hair. Then, head held high, she silently turned on her heel and left.

Consuelo looked at Anna, her face showing hurt and bewilderment. "Why does she hate me so much?"

You don't understand, do you? Anna shook her head. *Of course you don't. We made sure of that.*

The policemen moved back to Consuelo, who looked small and fragile in her gray prison uniform. At times like this Anna had to force herself to stay emotionally detached and profession-

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al. And keep reminding herself what this childlike young woman was capable of. No, Anna corrected herself, she had been capable of doing those things. Now, Consuelo was well. She *couldn't* do them anymore.

As the officers led Consuelo away, she smiled at Anna and said, "See you in a few days!"

Krueger moved closer to Anna. His head shook so hard sweat flew off his face onto her crisp white blouse. "Amazing," he said. "The things you see if you live long enough."

The lawyer heaved his massive buttocks onto one of the chairs in the now empty waiting room. Anna sat down a few meters away. During her career she'd worked with many lawyers. Contrary to popular opinion, especially among her fellow physicians, most of them seemed like relatively decent human beings. A few, though, made her want to take a long bath after being in the same room with them.

Even after working with him all these months, she still wasn't sure which category to put Krueger in.

The latter said, "Doc, do you really want to go through with this?"

"That's what I just told the parole board."

"Yeah, I know." The pitch of his voice rose to a sarcastic, singsong falsetto. "'I'm so confident the treatment was successful I'm willing to supervise and take responsibility for Consuelo myself.'" Then, in his usual bass, "Have to admit, that was a great performance you gave. Had the parole board eating out of your hand. Couldn't have done better myself."

Krueger snorted. "Of course, I'm not the one who might get murdered in my sleep."

"Consuelo's not dangerous anymore! She's cured!"

"Sure. Ain't modern medicine wonderful."

Anna frowned at him. "If I didn't believe it, do you think I'd put myself at risk?"

Krueger shrugged. "I'm sure *you* think your 'experiment' worked. Question is, did you brainwash her—or did she brainwash you?"

"It's not brainwashing! I wish people would stop using that word!" A voice in Anna's head whispered, *He's goading you.* More calmly, "Consuelo was born with a subtle genetic defect that caused parts of her brain dealing with behavior and feelings to be abnormal. Critical brain cells were either overly sensitive or didn't react enough to neurotransmitters that modulate anger and aggression. That neuropsychiatric defect gave her a poor capacity to deal with 'abandonment' by someone she loved and trusted. Her response in those situations was to lash out violently at the person she perceived as abandoning her."

Krueger snorted. "Yeah, she was good at 'lashing out'!"

"The point is, her underlying problem was biological in nature. By using this new treatment, we were able to correct it, and make the serotonergic, noradrenergic, and other systems in her brain work properly. Now, she's far less likely than the 'average' person to be violent with other people."

Krueger shook his head skeptically. "I've been in the criminal justice sys-

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tem for over thirty-five years. Seen too many cases of 'not guilty by reason of insanity' go into a loony bin for a while, come out after one of you shrinks said they're 'cured'—and then bounce back to court after they sliced-and-diced some more innocent people."

"But Consuelo won't do that! Criminally violent behavior can be due to antisocial personality disorder, schizophrenia, or other central nervous system abnormalities different from the one she had. The neurological and biochemical reasons for those disorders are still poorly understood. Even with the best available therapy, recidivism is common in those patients. In Consuelo's case, though, we discovered what biological defect caused her actions—and how to correct it. Her cure is permanent!"

"If you're so sure your treatment worked, why did you wipe out her memories of what she did?"

"Consuelo 'knows' what she did. People keep reminding her of it. She just doesn't *remember* doing it. We thought that eliminating those memories and the reactive emotions attached to them would be a good adjunct to her primary treatment. I'm certain she's no longer a danger to others, that even under the greatest stress she won't turn her feelings violently outward anymore. However, since she now has a normal capacity for empathy and remorse, she's still capable of self-destructive acts. If she were to dwell too much on what she did, if she could run over every detail of it in her mind again and again, she might feel so guilty she'd be tempted to harm herself."

"Well, considering what she did, maybe she *should* feel guilty!" Krueger shrugged. "But what do I know. I'm just a lawyer. You doctors are the ones with all the answers. Just to be on the safe side, though, I'll talk with the parole board again next month. If Consuelo hasn't killed anybody or burned down your neighborhood by then, maybe I can get them to treat her like a standard parolee. Give her to a regular parole officer, who doesn't have to live with her."

He shivered. "Living with her. Now that's a scary thought."

Krueger lifted himself from the chair and headed for the door, shaking his head. "Serotonergic. Recidivism. Five-dollar words won't be worth much when Consuelo's coming at you with murder in her eyes. And a knife in her hand."

On Sunday evening they brought Consuelo to Anna's house.

Anna met them on the front porch. Tall vine-covered fences shielded the house from her neighbors, so she couldn't tell if any of them had noticed her guest's arrival. Yesterday she'd met with the other homeowners in their isolated subdivision far outside the city. None openly expressed any fear of Consuelo. A few were concerned that she might act as a magnet for the media—especially the tabloid newspapers and TV shows. *What about our privacy?* Anna told them Krueger had let the media know that Consuelo didn't want to be interviewed. And if any reporter or photographer chose to ignore that—well, any stranger driving

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on the tiny subdivision's single private street was bound to be conspicuous. And the police were only a phone call away.

The two taciturn policewomen escorting Consuelo removed her handcuffs, dropped her battered suitcase, and left. Anna led Consuelo into the house's large foyer, closed and locked the door, then reactivated the security system.

So now it's just you and me.

Consuelo peered up at the large golden chandelier suspended from the ceiling. "Your house is so big, and beautiful!" The drab prison uniform she'd worn the last time Anna saw her had been replaced by a flower-print dress.

"Thank you. Let me give you a tour." After walking through the dining and living rooms they ascended a long staircase to the upper level. The younger woman kept chattering about how beautiful everything looked.

Anna said, "This is my bedroom." A large king-size bed dominated the room. Consuelo gazed longingly at the clothes in the walk-in closet. "You have so many beautiful dresses!"

"What size do you wear?"

"An eight."

Anna smiled. "My 'fat' dresses, when I've fallen off the wagon on my diet, are tens and twelves. But my 'thin' ones are eights. If you see any you like, go ahead and wear them tomorrow." She laughed a little, patting her hips. "Sad to say, none of my eights are very new!"

They walked to the end of the hallway, passing two rooms with closed doors. "This will be your bedroom."

Consuelo sat down gently on the plush quilt covering the bed. Colorful paintings hung on the walls, and a green vase with fresh flowers stood on a nightstand. A white desk and spacious chest of drawers lined the walls. "It's a wonderful room!" she said finally, her voice quivering.

Anna nodded sympathetically. Compared to the quarters Consuelo had just left, it was a wonderful room.

As they walked back to the top of the stairway, Consuelo asked, "What's in those other two rooms?"

Anna's eyes darted back to the two doors she always kept locked. "They're just bedrooms. Let's go downstairs."

Consuelo gasped as they entered the largest room in the house. "It's as big as a library!"

Fading sunlight shone through a large bay window. Deeply-stained wood paneling formed the walls of the room, ending in a high cathedral ceiling. A showcase of immaculate couches and chairs was distributed on the thickly-carpeted floor. Tall built-in bookcases stood on either side of an ornate brick fireplace.

Anna closed her eyes briefly, remembering when this room was far less quiet and pristine. When it echoed with high-pitched giggles of delight, and she couldn't walk more than a few steps before stumbling over a discarded toy.

Shaking herself, Anna gestured toward the big-screen television and entertainment center that dominated one wall. "Feel free to use the TV when I'm at work tomorrow. If there's nothing

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on you like, I have movies and music on DVD."

Consuelo wasn't listening. She was examining the contents of one of the bookcases, running her index finger carefully over the titles. Anna said, "Or read any books you like. Most of them are medical textbooks, but there are some romance novels and—"

Suddenly Consuelo's finger stopped on a dust jacket. As she stared at it her face turned pale, and she began to tremble. Anna moved closer, and read the title of the book Consuelo was touching. *Damn! How could I have been so stupid, to leave those out where she could see them!*

Quickly Anna said, "Have you had supper yet?"

Snapping out of her trance, Consuelo murmured, "No."

"Then let's go to the kitchen and make something." Anna forced a smile. "My cooking skills aren't the greatest, but I'm an expert with a microwave."

They ate at the kitchen table in silence. Consuelo seemed—distracted. A little sad. But, as far as Anna could tell, not dangerous.

At least, not yet.

After supper they returned to the family room, and quietly read some magazines. Anna peered over the latest *American Journal of Psychiatry*, watching the younger woman. *So far, so good.* She'd been afraid that, with Consuelo now outside the controlled, formal patient-physician sessions at the prison, the exaggerated mood swings and hostility her patient had prior to the treatment might return. But no, Consuelo still acted polite, friendly—almost shy. No definite signs of transference. Except, it seemed Consuelo considered Anna the "big sister" she never had.

Anna felt herself becoming more comfortable with Consuelo in their new relationship. The contrast between the surly, vicious woman she'd first met at the prison a year ago and the demure, sweet young lady reading silently a few meters away, was like night and day. Nature had played a cruel trick on Consuelo, giving her intelligence, physical health, even beauty—but ruining it all by also bestowing a biochemical quirk in her brain that ultimately made her life, and the lives of those closest to her, a horrible tragedy.

Although he said it sarcastically, Krueger was right about one thing. Modern medicine *was* wonderful. Now that the experimental treatment had cured her, Consuelo could be the person she should have been. Anna smiled, thinking it was like Mr. Hyde had turned into Dr. Jekyll.

Then she remembered how that story ended.

Consuelo put down her *Reader's Digest* and yawned. "If you don't mind, Dr. Young, I'd like to go to bed now."

"That's fine. By the way, you don't need to call me 'Doctor' anymore. 'Anna' will be fine."

"All right, Dr.—I mean, Anna."

"I'm due at my office at 8:00 tomorrow morning. If you need me, my office number is programmed into all the phones. I'll activate the security system if you're not up before I leave." Anna briefly described how to

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work it. "Feel free to go out on the back porch tomorrow. But remember to turn the alarm on when you come in. Also, for now, I think it'd be better if you just stayed in the house, or backyard. Please don't go out front."

Consuelo nodded knowingly. "I understand. I don't want to upset the neighbors."

"I'm not concerned about them. I don't want anyone coming to the house and bothering you."

Consuelo whispered, "Like those reporters. Or—" She left that sentence unfinished. But Anna knew who she was thinking of.

Then Consuelo said, "Is there anything I can do for you tomorrow? Clean the house? Cook supper for you?"

Anna started to reply that Rosa, the housekeeper, would do all that, but stopped herself. Unfortunately, Rosa wasn't coming back—at least, not until that *asesina* left the house. "You don't have to—"

"But I want to!" Consuelo smiled shyly. "You've done so much for me, the least I can do is help you!"

At Consuelo's insistence, Anna showed her where the cleaning supplies and dishes were kept. Her imagination said Consuelo seemed a little too interested in the long, sharp carving knives in the utensil drawer. But the rational part of her condemned that idea as paranoid.

After the younger woman went upstairs, Anna removed several textbooks from the bookcase in the family room. She didn't want them to upset Consuelo any more than they already had. Carrying the heavy books to her own bedroom made her back hurt.

Alone in the dark in her large empty bed, Anna reminded herself to call Bob Nemo at Northwestern and give him a progress report. The neurobiologist and his team had developed the techniques they'd used on Consuelo to modify and stimulate production of CNS neurotransmitter receptors. The methods for tracing and erasing memories for specific time periods were a little more standardized, though Nemo's own research had made them more accurate and effective. He and his staff had already published several basic science papers on the treatment, but they were expecting her to write things up from a clinical perspective. As she drifted off to sleep Anna thought, I've got to get my notes together and start writing. . . .

Suddenly her eyes opened. The room was pitch black. Something—some sound—had awoken her. Terrified, Anna remembered that the door to her bedroom was open. Reflexively she reached over to wake up Charles. But, of course, he wasn't there. Heart pounding, she strained to hear the faint rustle of bare feet across the carpeted floor. In her mind's eye she pictured a wraithlike figure coming toward her, knife held high—!

And then, faintly, at the other end of the hall Anna heard the sound of a toilet being flushed, followed a moment later by the faraway creaking of mattress springs. Sighing, she tried to fall asleep again. But the alarm clock went off before she could.

Just before Anna left for work she peeked into Consuelo's bedroom.

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The latter was still asleep, her angelic face aglow with sweet, innocent dreams. As Anna drove into the city she had second thoughts about leaving Consuelo alone in the house. No, she convinced herself, it wasn't because Consuelo might burn down the house or run away. But what if, suddenly alone in a strange place, she became frightened? Or what if one of those bastards from the tabloids came to the house and harassed her? The way that one TV show in particular had treated poor Consuelo still enraged Anna.

No, she should have canceled her appointments and stayed home. But Bill Skinner, her partner, was out of town for the week at a medical conference, so there was no one she could trust to cover for her. Although she had a responsibility to Consuelo, she had the same kind of responsibility to her other patients too. She couldn't just abandon them, by rescheduling them for next week—could she? Bill always said she was too obsessive-compulsive for her own good. Although it was painful to admit it, Anna knew he was right.

Her day was uneventful. All the patients she saw were doing fine. And there were no emergency phone calls about a disaster at her house.

Anna drove home in record time. *At least the house is still standing.* Entering the kitchen from the attached garage, Anna became worried when she saw the security system wasn't on. Then she heard music coming from the family room. The exhilarating conclusion of Beethoven's Ninth Symphony. Consuelo was probably in there, relaxing.

But as Anna headed toward the room that masterwork was followed by a few spoken words, then another piece—Gene Kelly's rendition of "Singin' in the Rain." She stopped, realizing that Consuelo wasn't listening to music. She was watching a movie. And Anna knew which one it was.

Gathering her courage, she called, "Hi! I'm home!" and entered the family room.

Consuelo was sitting on the couch, staring at the colorful closing credits on the TV screen. Seeing Anna, she said, "Hi! I didn't hear you come in!"

Acting nonchalant, Anna walked over and hit the "Stop" button on the DVD machine. "How did things go today?"

"Fine. Let me show you what I did."

Anna followed her to the kitchen. The vinyl floor, which had become scuffed and dirty since Rosa abruptly took her "leave of absence" last week, now sparkled. Anna noted approvingly that the stove and countertops were scrubbed and polished to a healthy glow.

Consuelo said, "I didn't know when you'd get home, so I haven't put supper on yet. Why don't you go relax, and I'll make it."

"That's fine, I can help—"

"No, you worked all day! Besides, I love to cook." Consuelo's face turned sad. "It's been a long time since I've had a chance to do it."

Yielding to Consuelo's pleas, Anna returned to the family room and collapsed into her favorite recliner. Closing her eyes, she listened to the clatter of pots and pans in the kitchen.

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Soon a spicy mix of mouth-watering aromas wafted to her nose. Anna sunk deeper into the recliner, feeling warm and relaxed . . . .

Suddenly she woke up. Anna dimly sensed Consuelo standing over her. There was something in her patient's hand. She was raising it up—!

"I'm sorry! I didn't mean to wake you." Consuelo gestured toward the kitchen with her wooden stirring spoon. "Supper's ready."

The *arroz con pollo* Consuelo made was fabulous. After finishing several servings, a terrible thought flashed into Anna's mind. But Consuelo had eaten the same food she had. And the younger woman didn't *seem* suicidal.

After taking care of the dishes and rejoining Anna in the family room, Consuelo said, "If you don't mind, Dr.—I mean, Anna—I'd like to go to bed now." She glanced at the clock on the mantle. "They always had 'lights out' at eight o'clock, so I'm not used to staying up later."

"That's fine. Oh, I almost forgot. When I came home, the alarm system was off."

Consuelo looked devastated. "I'm sorry! The weather was so nice, I went out on your back porch this afternoon. I must have forgotten to turn it back on when I came in." Tears welled in her eyes. "I'm so sorry!"

"That's all right. I just want you to be safe. Just remember to turn the alarm on when you come back inside."

Head bowed, Consuelo said contritely, "I will." Then she went upstairs.

Anna watched her go, puzzled. Was Consuelo acting a little too emotionally? Reacting too self-critically to "failure"? And if so, what did it mean?

Later, Anna went over to the entertainment center. Pushing the "Eject" button on the DVD machine, she removed her disc of *A Clockwork Orange* and replaced it in its plastic case. It was too late to hide that movie from Consuelo. But at least she could prevent any more matinees.

Then she checked her collection for other movies to censor. *One Flew Over the Cuckoo's Nest*? Yes. *Psycho*? Definitely! Anna shivered, reminding herself to lock the bathroom door when she took a shower.

Adding a dozen more discs to the stack, she held the last in her hand, and hesitated. Finally Anna placed the DVD in the machine, and spent the next two hours mesmerized by the original black-and-white version of *The Bad Seed*. Then she carried the discs upstairs and hid them under the mattress of her bed.

It was a long time before she fell asleep.

At her office the next day, Anna berated herself for not being able to control her fears. Consuelo *was* cured, she kept telling herself. The young woman's new personality was very pleasant and sweet. It couldn't be just an act. She could have run away yesterday, or attacked her at any time. But she hadn't. Didn't that prove she was cured? Unless—

Unless her patient had a more subtly sinister plan in mind. Like lulling her into a false sense of security be-

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fore striking. Or, even if Consuelo wasn't faking, maybe that explosive component of her old personality was still lurking beneath a fragile surface. All it might take was a wrong word, a misinterpreted action—and just like that dramatic scene in the Lon Chaney version of *The Phantom of the Opera,* Consuelo's mask of gentle sweetness would be ripped away, revealing the horror that lurked beneath.

When Anna entered the house that evening, the security system buzzed. *Good.* She punched in the code number and silenced it.

The meal Consuelo prepared was even better than last night's. As they were getting up from the kitchen table Consuelo said, "I hope you don't mind. I went out front to the mailbox this afternoon and got your mail."

"Thank you. I forgot to get it yesterday."

"Oh, when I went out, there was a package on your front porch."

Anna frowned. "I wasn't expecting anything. Where did you put it?"

"In the dining room."

The rectangular package lying on the table was wrapped in brown paper. Anna picked it up, turned it over—and gasped.

It was addressed to Consuelo.

Gripping the package tightly, frozen with fear, Anna strained to hear a ticking sound inside it. When it didn't explode, she relaxed a little. *Maybe if I put it in water, like they do in the movies—* But then another part of her said, *That's ridiculous! Open it up!*

The latter voice won. Trembling, Anna tore off the wrapping. Inside was a thin cardboard box. The kind used to hold clothes given as gifts. She removed the top and peeled back flimsy, crinkling paper.

From the corner of her eye Anna noticed that Consuelo was standing beside her, watching as she pulled a man's tie from the box. It was red and green, with smiling little Santa Clauses sewn on it. The kind of gift Charles used to get from his mother every Christmas.

The next item Anna removed was a woman's brooch. She placed it and the tie on the table.

Peeling more paper away, Anna removed a small, frilly dress. It was just the right size for a four-year-old girl.

The last item in the box was an even smaller two-piece green outfit for a boy. The label said "3T." On the front of the outfit's top was the picture of a teddy bear dancing beside a Christmas tree. Printed in red letters above the scene were the words, "Beary Christmas!"

Anna let a few angry sobs escape before remembering she wasn't alone. Straining to control her pain and fury, she looked at Consuelo. The latter was staring at the clothes with an expression of pain equal to her own. Consuelo said, "Why would anyone send me those things?"

Because she's vicious, and wants to hurt you! And, maybe, me too. Anna examined the paper the box had been wrapped in. The address label was plain white. Computer-printed. No return address.

Anna blinked. There was no postage sticker or stamps on it either.

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That meant *she,* or someone she'd hired, had put it on the front porch herself.

Phoning her neighbors didn't help. None had seen a gray-haired woman or any other stranger around that day. A call to Roy Krueger for advice got only as far as his answering machine. After leaving a message, Anna thought about calling the police. But, really, what could they do? Just come out, make a report, and leave. And even if they found *her* fingerprints on the wrapping paper or box, what was the worst they could charge her with? Trespassing? Nothing that would prevent her from doing something similar again.

Consuelo was unusually quiet the rest of the evening. Several times Anna tried to draw her out, but the younger woman was obviously too upset to discuss it.

"Please, Anna, don't make me talk about it! It hurts too much!"

Before Consuelo went to bed, Anna told her to be *extra* careful about keeping the alarm system on tomorrow. "And if anyone comes to the front door, don't open it!"

Afterwards, Anna hid the package and its contents in her own bedroom. That night, lying alone in her bed, for the first time since Consuelo came to the house Anna's fears were not centered on her. Now it was worse. Now she was more afraid of someone else. And that new person was, potentially, even more dangerous.

The next day all the patients Anna saw at her office were in better emotional shape than she was. She couldn't concentrate on her work. Feelings of anxiety, loss, and guilt kept bubbling up in her. Treating her like any other patient, the rational part of her brain advised her, *You need to work through those feelings. Don't let them control you.*

But just having that insight was useless. Even knowing with clinical precision what was going on within her, it was still a terrible struggle to deal with it.

When Anna entered the house that evening, the aromas of another of Consuelo's gourmet meals brought a small smile to her face. But then she heard someone sobbing.

Consuelo sat in the family room, face buried in her hands, crying.

"What's wrong?"

Consuelo's head jerked up, a terrified expression flitting across it until she saw it was Anna. "I went out to the mailbox after I finished making supper." She handed Anna a padded mailing envelope. "This was addressed to me."

Anna took it gingerly. The mailer was addressed just like the package yesterday. At least, she noted with relief, this one had stamps and had gone through the regular mail.

Consuelo sobbed, "I put them back in it."

Anna extracted some papers from the open envelope. Newspaper clippings, dated about two and a half years ago. A quick glance at their headlines told her what they were about.

Holiday Tragedy. Woman Held In Death Of Family.

After a moment Anna said, "What did

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you feel after you read those stories?"

Consuelo's voice was that of a frightened little girl. "Sad. Angry."

"Angry?"

"Yes. It made me very angry at the person who did those terrible things!"

Anna looked fixedly at the other woman. "You know who that person was, don't you?"

"Yes. It was me." Suddenly Consuelo jumped up, her face flushed. "But I don't *remember* doing them! I can't understand how anyone could be so—*evil!*" Her hands went up to the back of her head and pulled vigorously on her long black hair. "Why did I do it? What kind of person am I? Maybe it'd be better if I were dead too, so I can't hurt anyone else!"

"Sit down, Consuelo."

Hesitantly the younger woman obeyed.

Anna looked closely at her, trying to decide what Consuelo was *really* thinking. It would be so easy to believe she was telling the truth. In fact, Anna told herself, that's what I want to believe. But, she knew, merely wanting something to be true—even if you wanted it really, really hard—didn't necessarily make it so. She was *almost* certain Consuelo was sincere. But she couldn't be completely sure this wasn't an elaborate, manipulative act staged for her benefit.

Anna said, "We've been through this before. You were ill when you did those things. Now, you're well. You're not responsible for what you did back then."

"Then why do I *feel* like I am? Why do I feel so guilty?"

Anna hesitated. "It's going to take a long time to deal with those feelings, and work through them. But in time, you will." She felt her own eyes turning wet. "We'll talk about this again later."

Suddenly Consuelo leapt up and ran toward her. For a frightened instant Anna thought she was going to attack her. But Consuelo flew past her into the kitchen.

"Oh no! I forgot, the casserole's still in the oven! It'll be ruined!"

The food was, in fact, a little overdone. As they ate Anna became more and more angry. From a strictly biological standpoint, she believed, Consuelo was "cured." But like anyone recuperating from a severe prolonged illness, psychologically Consuelo was still weak and vulnerable. It was going to take time for her to become mentally strong—able to resist all the hateful things ignorant, spiteful people might do to her in the future. Until her sense of self-worth was restored, Consuelo needed to be protected. Especially from the brutally vengeful gray-haired woman Anna knew had to be responsible for those cruel "gifts."

Krueger was right about one thing. That woman *was* a bitch.

And I'm doing a damn poor job of protecting Consuelo from her.

Finally Anna decided. "I'm going to cancel all my appointments for the rest of the week. We're going to spend tomorrow and Friday together."

"No, you shouldn't change your plans just for me! I know you have other patients to take care of, too."

"It's all right. I'll reschedule those patients for next week." *Yes, they can*

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live without your support and guidance for a little longer. Can't they? "I'll tell my secretary to phone or beep me if there are any problems."

Anna smiled slightly. "You've been cooped up in this house since Sunday. Why don't we go out shopping tomorrow?"

Consuelo's eyes widened. "Do you really think we could? What if someone—?"

What if someone recognizes you? Well, if anyone tries to hurt you, they'll have to deal with me! "It'll be fine. We'll go downtown, and have a great time!"

Anna kicked herself mentally. Why hadn't she realized it sooner? By keeping her locked up in the house, from Consuelo's point of view it must be like she'd just exchanged one prison for another. True, this one was more opulent. But it was still a prison.

The telephone rang. A little afraid of who it might be, Anna walked to the living room and answered it.

"Hello?"

"This is Krueger. Glad to hear you're still alive. Been out of town the last few days, and just got your message on my answering machine. What's up?"

In a low voice Anna told him about the package and the envelope. Krueger grunted. "Well, it is a little late for April Fool's day."

"How can you joke about this? She's trying to undo everything we've done to help Consuelo! She's a malicious, vindictive—"

"Wait! Let's not jump to conclusions! Maybe *she* isn't the one who did it. There're a hell of a lot of people out there who wouldn't mind making your 'friend' sweat a little—or worse."

"Well, you're her lawyer! What are you going to do about it?"

"What am I going to do about it? Hmm. I'll have to give it some serious thought."

Anna pictured Krueger picking his nose at the other end of the line. "Listen," she said, "I'm coming downtown tomorrow. I'd like to stop by your office to discuss this in person."

"Sure. How about three o'clock? If I'm still seeing anybody then, I'll kick 'em out." He paused. "One more thing. Wear that tight white blouse you had on at the parole board hearing. It's my favorite."

Anna found herself listening to a dial tone. The delicately balanced opinion she had of Krueger tilted down towards "He's scum!"

Later, after Consuelo went to bed, Anna placed the package and envelope in an old shopping bag and put it in the trunk of her car. Maybe, when Krueger saw what that vicious gray-haired woman had sent Consuelo, he might think of some way to stop her.

But she doubted it.

Next morning, while Consuelo cleared off the breakfast dishes Anna called her secretary.

"No problem," Mike told her. "I'll phone all your patients and reschedule them." Then she and Consuelo headed downtown.

It was a beautiful spring day. Tulips and daffodils were in full bloom along the streets and highways. They spent the morning flitting from store to store.

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After a while, when everyone seemed to pay no more attention to Consuelo than to any other shopper, Anna relaxed and started to enjoy herself.

Once, she saw Consuelo examining a small painted porcelain figurine. It was a cherub-faced little boy about five years old, with a fishing pole slung over one shoulder and a puppy tagging along beside him. After checking the price tag, Consuelo reluctantly put it down. She saw Anna looking at her, and said, "They only gave me back a little money when I left."

Anna picked up the figurine. Overpriced, but if it made Consuelo happy—

"I like it too. Let's buy it."

Anna sighed sadly. With the nest egg she and Charles had accumulated before the accident, and the life insurance policy, money was the least of her problems.

After lunch, Anna remembered she hadn't bought Easter gifts for her nephews yet. In a nearby candy store they were surrounded by rows of chocolate bunnies, pink and yellow marshmallow chicks, and boxes of brightly colored jelly beans. After they carried two large Easter baskets filled with treats and small toys back to her car, Anna had an idea. "Would you like to visit my nephews with me this Sunday? The boys would love to meet you!"

Consuelo looked at her a little fearfully. "How old are they?"

"Christopher is six, and Matt turns three next month." She frowned seriously at Consuelo. "There's one thing you have to remember when you meet them. It's very important."

Consuelo leaned forward anxiously.

"Christopher is pretty sophisticated for someone in kindergarten. He might ask some embarrassing questions about where their baskets came from. Just remember, the Easter Bunny left them at Aunt Anna's house. That's our story, and we've got to stick to it!"

For the first time Anna saw Consuelo give a real smile. It was a nice, happy one. The first, she hoped, of many.

She made a mental note to call Karen. But if her big sister said it was safe, Karen wouldn't mind. And as for her nephews—well, their minds would be on their gifts.

Besides, they still had a few more precious years of innocence left.

Euthyphro: *People do all kinds of wrong, and then there is nothing they will not do or say in order to escape the penalty.*
Socrates: *Do they admit wrongdoing, Euthyphro, and, while admitting it, deny that they ought to pay the penalty?*
Euthyphro: *No, not that, by any means.*

—Plato

Suddenly Anna remembered the appointment with Krueger she'd made the night before. And realized she'd forgotten to tell Consuelo about it.

The latter's smile disappeared. "Do you want me to go in with you when you talk to him?"

Anna grimaced, imagining what kind of sensitive and compassionate things Krueger might say to Consuelo. "It might be better if I talked to him alone."

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For someone who was supposed to be on her side, the lawyer was sometimes incredibly hard on Consuelo. Anna had asked Krueger once why he'd even taken her case. He'd shrugged and said, "Everybody's entitled to legal representation." Then he'd looked at her strangely. Almost—guiltily. "And I have personal reasons too."

After parking hurriedly, Anna removed the shopping bag she'd loaded into the trunk last night. Although Consuelo didn't ask what was in it, Anna knew she could guess what it contained.

Krueger's office building had seen better days. After riding a rickety elevator to the sixth floor, they walked to a door that desperately needed a new coat of paint. On the translucent pane of glass forming its upper half were the words, "R. F. Krueger, Attorney at Law." Since the last time Anna was here, a fellow fan of old movies had used a black marker to add "U." before the lawyer's name, and "reddy" after his middle initial.

The gum-popping nubile redhead at the secretary's desk was new, too. Anna wondered what had happened to the bleached blonde. She noted that both the former secretary and her successor had several things in common. Both seemed likely to have had cosmetic surgery involving their pectoral regions. And both favored tight white blouses.

"He's still with a client. Have a seat." The secretary pointed at several dilapidated chairs.

The intercom on her desk snapped on. "Crystal, it's three o'clock. Is anybody out there?"

"Yes."

"Is one of them a tall woman, natural blonde, late thirties, pleasingly plump, wearing a tight white blouse?"

The secretary squinted at Anna. "Yeah, except it's a loose pink one."

The intercom clicked off. Immediately Anna heard shouting from the door behind the secretary. Then it flew open and a small elderly man with glasses askew catapulted out the door. He protested, "But we haven't finished talking about my—"

"Sorry," Krueger interrupted, his bulk blocking the entrance to his private office, preventing the man from reentering. "My secretary will give you another appointment for tomorrow."

"But—"

"Tomorrow!" Krueger motioned Anna to enter, closed the door behind them, then settled down into a swivel chair behind his desk. "Some people," he said. "Just because you take their money, they think they own you."

Krueger's office was filthy. Huge law books were scattered across the floor. His desk was littered with empty snack food bags and carry out containers.

The lawyer gestured at her shopping bag. "Buy anything for me?"

Anna placed the items in the bag on his desk. Krueger examined them carefully. She noticed his fingernails were disgustingly long and sharp.

"Did you call the cops?"

"No."

Krueger shook his head. "Should have. Not that they'd have done anything with this stuff. But if they filed a

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report, I could use it as one more piece of evidence if somebody does catch her in the act."

"Is there any way you can prevent her from doing anything like this again? Maybe a restraining order?"

Krueger shrugged. "Might be able to get one. Won't do much good, though. There's no law against giving anyone 'gifts.'"

"But they're a form of psychological attack!"

"True. And let's face it. You-know-who is more qualified than anyone else to mess with Consuelo's mind." He paused. "Present company excepted, of course.

"But a judge probably won't see it that way. If it was some innocent young thing being harassed by a drooling thug, getting a restraining order would be no problem. Trouble is, I doubt Consuelo would be the person the judge would sympathize with."

"But that's not fair! Now that she's cured, Consuelo is innocent in the moral sense of the word!"

Krueger grunted. "Maybe. But in the eyes of the law, she's still as guilty as sin."

"Then the legal system needs to get rid of that Dark Ages mentality. This is the twenty-first century! All these people have labeled Consuelo as being 'evil,' and now they want to keep on punishing her instead of trying to help her! They treat her like she was some kind of monster, instead of a human being who was mentally ill and not fully responsible for her actions!"

The lawyer nodded vigorously. "You're so right. How could anyone hate her or think she should be locked up? Everybody makes mistakes. If she says she's sorry and promises never to kill any more people, we should let bygones be bygones."

Anna struggled to control herself. The man's sarcasm was so irritating! "Don't misunderstand me. What Consuelo *did* was terrible and wrong. And I remember very well what she was like before the treatment. At that time, she *needed* to be in prison, so she couldn't hurt anyone else, or herself. But that's no longer necessary. She's cured now, and to punish her for things she did when she was sick is cruel!"

Krueger put his feet on the desk. "Tell me, Doc. How do you *know* she's cured? Maybe this sugar-and-spice-and-everything-nice stuff is just an Oscar-winning act. How do you know she isn't laughing inside, at how she's fooled all you high-powered doctors and the parole board?"

Yes, how do you know?

"All of Consuelo's post-treatment test results were perfectly normal. Not just the psychological profile tests either, but ones she couldn't possibly fake. Like the microaveraged EEG, her 5-HIAA levels, the ultra-resolution PET scans—"

Krueger interrupted her. "Spare me the jargon. The bottom line is, until you docs come up with some way to read minds, the only way to judge if she's *really* 'cured,' like you claim, is to see how she *acts*. And that's still a lousy way to judge people. If you're dealing with somebody who's smart and sick enough, you can really get fooled.

"I remember one client in particu-

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lar. Middle-aged, distinguished-looking. Great sense of humor. Pillar of the community. He had busloads of character witnesses at his trial. Not the kind of person who rapes teenage girls and tortures them to death. 'A clear case of mistaken identity,' I said. 'DNA evidence isn't infallible.' The jury wasn't gone long enough for me to go take a leak before they found him 'not guilty.'"

His eyes seemed to sadden. "A month later, the cops caught him red-handed hacking up the body of his latest victim."

Krueger's usual cynical look returned. "When something like that happens, it's time for Plan B. You try to show why your client isn't fully responsible for what they did. What you doctors have done is hand defense lawyers the perfect excuse. 'It's not my client's fault. He just has bad genes!'"

"But that's not necessarily true! An individual's personality and actions are influenced by their biological makeup. Rarely, with diseases like schizophrenia, or more subtle defects like the one Consuelo had, genetic influences are so strong they practically make a person act a certain way. But usually non-biological factors, such as what a person's been taught is 'good' or 'bad,' 'right' or wrong,' are stronger."

Krueger nodded. "The old question of 'nature versus nurture.' But don't people also act the way they do simply because they want to? Because they *decide* to do something?"

"Well—of course. Within the biological limits Nature gave them, and what they've learned from interactions with their environment, especially other people, a 'normal' adult also makes conscious choices."

"In other words, how people act is based partly on things they have little or no control over, like how their brains are 'wired,' or what they're taught—and what they deliberately *choose* to do."

Anna nodded. "Yes. But it may be very difficult to say how much each of those factors contributes to a particular individual's actions."

"That *is* a problem, isn't it? Unfortunately, the legal system has to deal with it all the time. Prosecutors tend to argue a person should be held completely responsible for their actions, and downplay mitigating circumstances. They try to keep justice simple. 'Just the facts, ma'am.' 'An eye for an eye, a tooth for a tooth.' Black and white, with maybe a few shades of gray." He waved his hand at the items on his desk. "Just like Consuelo's gift-giving 'nemesis' seems to be doing.

"When you're defending somebody, though, it's just the opposite. If it's obvious your client did what they're accused of, the fallback position is to come up with plausible reasons for what they did. Like, 'My client had a rotten childhood.' Or, better yet, accusing the victim of the crime, or 'society' of being responsible instead. With some of my clients, I've had to come up with really creative excuses. Funny thing is, the more outrageous they are, the more juries are inclined to swallow them. The old 'big lie' theory, I guess."

Krueger frowned. "Don't look at me like that. It's not all b.s. If you or I

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had been abused or neglected when we were kids, or grew up in a neighborhood where the most lucrative career choices were pusher or hooker, maybe we wouldn't have grown up to be the fine, upstanding citizens we are either. 'There but for the grace of God go I.'"

He slid his feet off the desk. "And whether *you* think it's fair or not, I and every other defense lawyer will *have* to exaggerate this 'bad genes' excuse if we don't want to get sued for legal malpractice!" A mock-sincere look came to his face. "'Distinguished members of the jury, it's now been scientifically proven that a person can kill other people, not because they chose to do it, but because of the way their brain is made.' Then I'll talk about the 'neuropsychiatric defect' Consuelo had, and how you turned her into a model member of society by treating it. 'My client couldn't help himself. It's not *his* fault doctors don't know yet what kind of brain disease made *him* kill those people! It's not his fault they don't have a cure for it, like they found for Ms. Lopez!'

"Or maybe, with a conservative jury, I'll use that old Sunday School idea of 'original sin.' You told the parole board all of us have—what was it?—'neurobiologically-mediated personality traits.' That the difference between a psychopath and somebody normal like you or me is just what particular traits and tendencies each person's brain is preprogrammed to have."

"Yes, but—"

"But that means some poor souls, just by bad luck and no fault of their own, are born with brains more susceptible to doing 'evil.' And isn't it only fair those of us who were 'luckier' and got 'healthier' brains should feel compassion for our less fortunate brethren?"

Krueger glared at her. "Let me tell you what this 'treatment' you doctors have come up with is going to do. Other lawyers are going to twist the facts about it too, and dream up even more imaginative excuses to help their clients shirk responsibility for what they did. For every person like Consuelo you help, a lot more people will get less justice than they deserve because of what you've done.

"Hell, you've given a 'scientific' excuse for anarchy! Now anybody can say, 'I can do what I want, when I want to do it. But nobody can hold me accountable if anything I do hurts me or anybody else, because it's just the way my brain is made.' And you can't have much of a society, or anything approaching justice, if people's freedom isn't coupled with a strong sense of personal responsibility!"

Anna blinked. "But that's not what we intended to do! We just wanted to help Consuelo and others like her! What you're talking about is a perversion of the truth and what we tried to do!"

"Good *intentions* don't mean anything. The only thing that matters is what actually happens after you do something, and not what you wanted to happen."

Krueger looked at her contemptuously. "You ivory tower science types think truth is something *objective*. That it's just waiting to be discovered, then everybody will agree what it is.

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But in the real world—like with juries—what is true is less important than what you can *convince* people is the truth. Maybe that's not the way it should be. But that's how it is."

He snorted. "If your treatment really did work, I guess Consuelo is now the only 'good' person in the world. The only one free of 'original sin'—if you believe in that crap. Problem is, you doctors still haven't come up with a magic pill to 'save' the rest of us sinners, and make us into little angels too. When you do, we can all beat our swords into plowshares, and the meek will inherit the Earth."

His eyes bored into hers. "But until you do it, there's going to be hell to pay!"

Anna tried to think of an answer. Before she could, Krueger grunted, "But hell, what am I doing, telling *you* that people are complicated."

Anna looked at him, very confused. "Yes, they are."

The lawyer motioned toward his desktop. "I'll keep this junk you brought. Maybe I'll figure out some way to use it to keep her from harassing Consuelo. In the meantime—both of you better be careful. She's probably just out to get Consuelo. But she might figure 'The friend of my enemy is my enemy too'—and also try to get *you*."

Anna nodded. As she got up to leave Krueger said, "One more thing."

The eyes in his pudgy face lingered lasciviously on her chest. "That pink blouse you're wearing is my second-favorite."

Consuelo didn't ask what Krueger said, and Anna was too lost in her own thoughts to tell her. An hour later they drove back onto the single, elm-lined street of her subdivision. Arriving at the house, Anna checked the mail and looked for packages on the front porch. Today, at least, there was nothing new to worry about.

The supper Consuelo made that evening was her finest yet. Normally Anna didn't care for mutton, but the way Consuelo made it was wonderful. As she passed a basket of hot rolls to Anna, the younger woman said, "I want to thank you again for everything you've done for me."

Consuelo poured a little wine into Anna's glass. "Whatever happens, I hope your memories of me are good ones."

Her words made Anna uneasy. "Are you afraid something is going to happen to you?" *Or are* you *planning to do something?*

Consuelo sighed. "I don't know what's going to happen. It seems like I'm just living from second to second, with no control over what happens to me."

I know the feeling. "This is a difficult period of transition for you. It's going to take time for you to get your life back on track. But I know you can do it."

Consuelo smiled. "Thank you. You've been very kind to me, and I'll never forget you."

The rest of the evening went quickly. Consuelo sat silently on the couch in the family room, seemingly lost in her own thoughts. Nestled nearby in her recliner, Anna brooded over what Krueger had said in his office. Earlier she'd turned the radio on and tuned

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in a classical music station. The choral music playing softly in the background made the atmosphere even more somber.

Consuelo got up. "I think I'll go to bed now."

"Is there anything special you'd like us to do tomorrow? Remember, we'll have the whole day together again."

"I'll think about it."

After Consuelo went upstairs, Anna remembered the things they'd bought today were still piled on the dining room table. She walked to the other room and examined each of their purchases carefully. Picking up the small figurine Consuelo liked so much, Anna carried it to the family room. She set it on an empty shelf, then stood back and gazed at it pensively. The little face of the figurine smiled sweetly back at her. Anna noticed the boy's hair was black—just like Chuckie's, or his father's. In fact, Chuckie would have been five now, just like that boy—

The music in the background ended. As Anna turned off the radio the announcer said, "You have just heard a performance of the oratorio *Christ on the Mount of Olives,* by Ludwig van—" Then, her back hurting again, she went upstairs.

But instead of going to bed, Anna walked to one of the two doors she always kept locked. Using a key she took down from the lintel, she unlocked it and entered the room. Fifteen minutes later, her eyes wet and red, Anna emerged and went to her own bedroom.

That night she cried herself to sleep.

* * *

Anna woke abruptly from a nightmare, a scream strangling in her throat. She was driving their old Volvo on a dark moonless night along a lonely country road. On her right Chuckie was sleeping in his car seat. She glanced in the rearview mirror at the back seat of the car. Even Charles had dozed off, his mouth hanging open. Becky, their four-year-old, was also asleep, snuggled against her daddy.

Suddenly, in the glare of her headlights Anna saw someone standing in the middle of the road just ahead. It was Krueger, leering at her and playing with his crotch. After an instant's hesitation her foot slammed down on the brake. As the car skidded toward him Krueger never moved. The leer was still on his face when the vehicle hit him and sent his body careening off into space. Then the car was spinning out of control, she screamed as it turned over and over—!

Anna finally stopped hyperventilating. Sitting up in the large empty bed, she clutched her knees and rocked gently, remembering. . . .

They'd spent a wonderful weekend together at that resort by the lake. Early Sunday evening, Charles suggested they change their original plans and stay there overnight. Everybody's tired, he'd said, especially the kids. We can drive back home in the morning.

But she insisted they stick to the schedule and go back that evening. "I have patients scheduled in the office tomorrow morning," she said. "I have a responsibility to them!" And no, she wasn't going to call Bill Skinner to cover for her. Her partner didn't know the patients as well as she did.

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It wasn't fair to Bill or to her patients.

Even now, four years later, Anna couldn't remember exactly what happened. Maybe, like the rest of her family, she'd fallen asleep too—just long enough to lose control of the car.

They said that Charles and Becky died almost instantly. Maybe, sleeping in the back seat, they just never woke up—never suffered, never knew what happened. The airbag helped her escape with only a concussion, a compression fracture in her lumbar spine, and a few other broken bones.

But Chuckie was too tiny for even the special "ChildSafe" airbag on his side of the car to help him much. A week after the accident, they wheeled her to the pediatric ICU to be with him one last time. Anna knew all too well what the criteria for "brain death" were, and what had to be done. As the pediatrician solemnly turned off the ventilator, she'd clutched the hand of the still, broken body of the little boy on the bed and cried until they had to gently wheel her away.

Months later, Anna decided that going back to work was the only thing left for her to do. Though it was too late for her, at least she could salvage something from her life by helping other people. Or maybe it was just her damn obsessive-compulsive nature taking over again. A single-minded devotion to "duty," "hard work," and "being productive." That personality trait had served her well for many years, helping her excel in college and medical school, making her successful and respected by colleagues and patients.

And that same personality trait had destroyed her life, and those she loved.

It would be so simple, so comforting, to blame her own biology for what she'd done. To say her brain was subtly "programmed" to act that way, so what happened wasn't entirely her fault. But Anna wouldn't let herself off that easily. She had made a foolish choice—not deliberately, but because she was careless, and had the wrong priorities. Her family had paid with their lives for her mistake. And now she had to live in a lonely hell of her own making.

The clock on her nightstand showed three in the morning. Sighing, Anna lay down again. There was no way she was going to find answers for the questions tormenting her right now. Better to just get some sleep.

Then she remembered something Bill Skinner said sometimes. In the light of day it always sounded trite. But now, with darkness all around her, it seemed strangely profound and comforting.

"Even psychiatrists get the blues."

At ten o'clock the telephone rang and woke her up.

It was Mike, her secretary at the office. "Dr. Young, I wasn't able to reach four of the patients you have scheduled for this afternoon and rebook them. What should I do?"

Without thinking she said, "That's all right. I don't want them to make a wasted trip. I can come to the office for a few hours and see them."

After she hung up Anna remembered she'd promised to spend the

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whole day with Consuelo. Now she was going to break that promise. No, before she went to work, she needed to talk with Consuelo about it. After dressing, Anna walked downstairs to find her.

The house was deathly quiet. Consuelo wasn't downstairs. Anna checked the backyard. She wasn't there either.

Then Anna knew what had happened. Consuelo must have run away! She remembered the strange things the younger woman had said the night before, and suddenly it seemed inevitable. It just goes to show, she told herself bitterly, you can never really be sure what's going on in another person's head, or trust them completely.

But as she started to phone Krueger to tell him, Anna thought of one last possibility. Going back upstairs, she peeked in Consuelo's bedroom.

Consuelo lay on her bed, sleeping peacefully. On her face was a look of angelic innocence.

Anna sighed in relief, then berated herself for her lack of faith. It was "reasonable" and "prudent" not to trust Consuelo completely. She still found it difficult to make the leap from "I *think* she's cured," to really *believing* in Consuelo.

Anna smiled slightly. Although she hardly thought of him as a theologian, maybe Krueger was right about that too. Wouldn't it be nice to think that, of all the adults on Earth, the "new" Consuelo was the only one who was truly "good"? The only one whose—what did Krueger call it— "original sin" had been wiped clean?

She didn't have the heart to wake Consuelo. So she wrote a brief note explaining she'd been called unexpectedly into work, and would be back soon. Anna quietly placed the note on a corner of the desk in Consuelo's bedroom, and left.

But as Anna drove to her office, a nagging doubt tugged at the corner of her mind. She was doing the right thing, wasn't she? She had an obligation to the patients scheduled to see her, and had to fulfill it. And she'd also taken care of her duty to Consuelo, by letting her know where she was going and that she hadn't abandoned her. Yet, as reasonable as that analysis seemed, Anna still had a sense of foreboding. A feeling that, somehow, she was making a mistake.

Oh, arm yourself in steel, my heart! Do not hang back from doing this fearful and necessary wrong. . . . Just for this one short day be forgetful of your children, afterward weep; for even though you will kill them, they were very dear.

—Euripides

Consuelo woke up slowly, and looked at the alarm clock. Almost noon. Dr. Young—*Anna,* she corrected herself—must have known how bad she felt, and let her sleep. She forced herself to sit up on the side of the bed, carelessly threw on a bathrobe, and shuffled with eyes still half-closed toward the bathroom. As she passed the desk in her bedroom the edge of her robe brushed against a crisply folded piece of paper. The note fluttered behind the desk and fell to the floor, unnoticed.

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After freshening up, Consuelo put on a clean white dress and went downstairs. She searched every room, puzzled. Where was Anna? Didn't she say she'd be staying home with her today? Maybe she'd been called out on an emergency. After all, the doctor had other patients besides her. Still, she couldn't help but feel—abandoned.

Consuelo ate lunch, then decided to clean the bedrooms. Returning upstairs, she noticed that the door to one of the two rooms that were always locked was open just a crack. She hesitated, wondering if it was right for her to look inside. Finally, curiosity won out.

It was a nursery. Blue wallpaper with a pattern of brightly colored balloons covered the walls. A large wooden crib dominated the room. It was filled with small toys and stuffed animals. One of the latter looked vaguely familiar. She picked up the smiling purple dinosaur with a green chest, trying hard to remember something. Then she squeezed the toy's left paw—but nothing happened. Wasn't it supposed to play a song?

On a chest of drawers was the picture of a baby boy, perhaps one year old. He smiled out at her from the frame with big blue eyes. As Consuelo stared at the photograph his face seemed to blur, the skin turning a little darker, the eyes a deep black. Then the illusion was gone.

Carefully replacing the stuffed dinosaur where she'd found it, as Consuelo started to leave she saw a key on the floor. It unlocked the door of the adjacent room.

This one was almost a duplicate of the bedroom she was using. Except the furniture was smaller, just the right size for a little girl. It too held stuffed animals and toys. Mostly dolls, but there was a child's plastic doctor's kit too. And another photograph. At first Consuelo thought the little girl had black hair, long and straight.

But her eyes were playing tricks with her again. The girl in the picture had blonde hair, short and curly.

Consuelo walked pensively down the stairs to the family room. For many minutes she sat on the couch in the deathly quiet house, trying to dredge up memories. And deal with the terrible feeling of loss and guilt deep within her.

The clock on the mantle chimed two o'clock, startling her out of her trance. Hoping more sound would distract her from her thoughts, she walked to the entertainment center and turned on the radio.

A voice said, "—Now hear Haydn's oratorio, *The Seven Last Words of Christ on the Cross*." Then an orchestra began to play dark, foreboding music. Its mood of hopeless grief and impending tragedy fitted her own perfectly.

So engrossed was she in the music that it took her a few seconds to realize the doorbell was ringing. Half way to the front door Consuelo stopped, hesitating. Anna wouldn't want her to answer the door, concerned that it might be someone who wanted to hurt her. But, she told herself, I can't hide and live in fear the rest of my life. Head held resolutely high, she turned off the security system and unlocked the door—

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There was no one there. No sign anyone had been there—except for the small brown envelope atop the "Welcome" mat. Consuelo picked it up, closed the door, and walked back to the family room.

The envelope was addressed to her. Inside was a silver disc, with two words written on it in black.

PLAY IT.

Consuelo turned down the radio, turned on the television, inserted the DVD into the player, and pressed the "Start" button. Returning to the couch, she waited.

Suddenly pulsating synthesizer music filled the room, accompanied by the applause of an unseen audience. The TV showed a brightly colored studio set with two smartly-dressed young people sitting on plastic chairs. The amply-endowed woman on the left exposed a pearly grin to her male co-host, then looked at the camera. "Thank you for joining us on 'America's Most Hated Criminals!'"

The woman's face turned serious. "Our first story tonight is about motherly love gone horribly wrong."

The scene switched to a picture of a chubby, laughing baby girl in a highchair. "Consuelo Lopez should have been destined for a happy life. The only child of two well-to-do physicians, she grew up in a fashionable suburb near Chicago."

A montage of photographs flashed on the screen. A shy seven-year-old standing straight and tall in her crisp white First Communion dress and veil. A gangly raven-tressed girl, blossoming into young womanhood, at her Confirmation. A confident teenager, sitting at a long table captaining her high school debate team.

The narrator said, "Consuelo was raised with all the advantages a pair of loving, doting parents could give her. She was a favorite of the nuns who taught her in high school. A model student. Senior class president. Editor of the school newspaper. Valedictorian. A devout, religious girl who even considered entering a convent.

"Then it was on to college for Consuelo, with new achievements and honors." More photos. In one she was in her dorm room, with her smiling parents on either side of her. "Phi Beta Kappa. Summa cum laude. A straight-A student, graduating with a degree in biology.

"Then, medical school." Stock footage of earnest young people in white lab coats working in a laboratory. "In her first three years, Consuelo again excelled in her work and studies. A bright future as a healer of human suffering seemed assured for her."

Suddenly the perky music on the TV took on a sinister tone. "But then, tragedy struck." The picture in her dorm room with her parents returned. "Her father, a prominent heart specialist, suddenly died himself of a heart attack."

A computer-animated black "X" superimposed itself on Papa.

"Consuelo had been very close to him, and took his death hard. Her grades plummeted. She became unreliable and apathetic, even hostile to those who tried to help her. Finally, after she made a careless mistake that nearly caused a patient's death, she dropped out of medical school a few months be-

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fore she was due to graduate."

The camera showed the studio set again. The grinning young man with blow-dried hair asked his co-host, "What happened next, Peggy Sue?"

"Well, Todd, Consuelo's life fell apart." The TV showed a filmed sequence in a dingy smoke-filled tavern. Seated on a stool at the bar was a young Hispanic woman who didn't really look like her at all. Her scarlet lipstick was smeared, and she was wearing too much mascara. The word "Reenactment" flashed briefly at the bottom of the screen.

"We interviewed some of those who saw first-hand what kind of 'career' Consuelo now began. They all said the woman who once considered becoming a nun plunged into a cesspool of alcohol and promiscuity."

The actress drained a glass of dark-colored liquor, then added it to the other empty glasses scattered in front of her. A fat, sweating man in his late fifties sat on the stool next to hers. The eyes in his pudgy, familiar-looking face lingered lasciviously on the firm breasts beneath her tight white blouse. Then he whispered something in her ear. The actress shrugged apathetically. The man placed some money on the counter, winked at the bartender, and led the woman out the door.

There was a close-up of Peggy Sue's painted face. "But after a year of this sordid behavior, Consuelo seemed to get her life back together. She renewed her acquaintance with a former medical school classmate, a promising young doctor training to become a surgeon. He and Consuelo rented a house and moved in together. A year later their daughter Maria was born."

The picture of a plump, giggling baby girl in a highchair filled the screen. "Now the woman who had almost become an M.D. settled into the role of 'housewife,' tending to the domestic needs of her lover and their child. A few years later their family had a new addition." The next photo showed a two-year-old girl with long black hair gamely struggling to prop up her six-month-old brother for their portrait.

"But this happiness was not destined to last."

More stock footage. A night scene of police officers outside a small white house, the red lights of their cars flashing. "Shortly after that picture of their children was taken, Consuelo's lover told her he'd fallen in love with another doctor at the hospital where he worked. She was the daughter of a prominent local surgeon, and he was planning to marry her after they finished their training. A neighbor, alarmed by the violent arguing and threats Consuelo was screaming, called the police. They arrived just as the door of the house burst open and her boyfriend ran out, pursued by Consuelo—a long, sharp butcher knife held high in her hand.

"Perhaps loving her daughter 'not wisely but too well,' Consuelo's mother used her influence and money to bail her out of jail. But as soon as she was free, Consuelo betrayed that trust—and ran away. No one knows where she went for the next year and a half, or what she did.

"After Consuelo disappeared—a

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fugitive from the law—her lover abandoned their two children, relinquishing custody of them to her mother. For the next seventeen months that woman lovingly raised the children in her own home. Then, with his new wife insisting that it was the right thing to do, the children's father changed his mind. Telling Consuelo's mother that he and his wife loved the children, that it would better for them to have two parents, he finally convinced her to give them back to him."

Another filmed vignette. The small white house at night again, this time brightly decorated with flashing multicolored lights, a plastic Nativity scene in its snow-dusted front yard.

"Then, on a foggy Christmas Eve, several months after her ex-lover was married, Consuelo returned to the house they'd shared."

The scene dissolved to the interior of the darkened house. The camera, simulating an eye-level point of view, moved furtively past the tall Christmas tree in the living room. It stopped in front of a door. A woman's hand reached out and opened it. Illuminated by a lamb-shaped night light, a small dark-haired girl and her little brother slept peacefully in their beds. Both wore smiles of angelic innocence, as visions of what the morning would bring danced in their heads.

The hand pulled the door closed and locked it. The camera moved swiftly to another bedroom. There, a man and woman slept tightly entwined on their bed, unaware.

Then the camera showed the actress from the bar scene. She held a long sharp butcher knife in one hand. Her eyes blazing with rage, she plunged it down again and again, its gleaming blade dripping ever more heavily with blood. After a few muffled screams, the night was again silent.

Nonchalantly dropping the knife, the woman returned to the living room. She piled the gaily-wrapped packages on the floor closer to the Christmas tree, then splashed them with fluid from a can labeled "Gasoline." A cigarette lighter flashed in her hand. The tree burst into flames—

Video of somber-faced individuals stepping carefully in the charred remains of the house early Christmas morning. One of them picked up a small stuffed dinosaur, a few patches of purple still showing on its singed covering.

The scene dissolved to Peggy Sue's face. "When the firefighters arrived, they found Consuelo Lopez sitting on the sidewalk outside the burning house, watching it collapse like a funeral pyre. Clutched in her blood-stained hands was this picture." She held it in front of the camera. It was the photograph they'd shown before of the two smiling children.

A quick shot of Todd's face. "What happened next, Peggy Sue?"

The picture of a gray-walled prison appeared. "Consuelo's lawyer tried to get her off by pleading 'not guilty by reason of insanity.' But that desperate ploy was undercut by Consuelo's confession in court that yes, she killed them, and she was glad she did! She was convicted of murder and sentenced to life in prison."

Consuelo's head jerked up. It sounded like the front door closing.

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Before she could decide whether it was her imagination or not, the TV program caught her attention again.

Peggy Sue's face showed outrage. "But it's possible that, someday soon, Consuelo Lopez will walk free among us again. Recently a group of doctors have tried to reopen her case. They claim she was 'mentally ill,' not fully responsible for her actions—and not just someone who deliberately, methodically, cold-bloodedly committed a vicious and senseless crime. No, these doctors say she had a 'neuropsychiatric defect'—whatever *that* is—when she brutally murdered her former lover, her rival for his affections—and her own children. And that they have a 'cure' for it."

A familiar face came on the screen. The caption at the bottom said, "A. F. Young, M.D. Psychiatrist."

Anna said, "Ms. Lopez has always been genetically predisposed to development of a variant of borderline personality disorder. For most of her life, it was like a hidden time bomb, with no sign of its presence—until the right type of stresses set it off. But now we know enough about this kind of mental illness to cure it permanently, so she would never feel compelled to hurt anyone who 'abandoned' her again."

Dr. Young's voice faded away, replaced by that of Peggy Sue. "But is that really true? Was Consuelo really programmed, like a robot, to kill? Or was it her own evil choice? Let's hear from a real expert, with more impressive credentials."

A gray-haired woman appeared on the TV. Her caption read "M. T. Aguilar, M.D., Ph.D. Professor of Psychiatry. Author of many books on personality disorders and criminal psychology." Reflexively Consuelo looked at the nearby bookcase, and noticed the books she expected to see were missing.

Her face harsh and severe, the gray-haired woman said, "It would be wonderful to think Consuelo could be 'rehabilitated' just by giving her the right kind of medicine. There is, I admit, a chance the experimental treatment planned for her could work. But what I'm afraid will happen is the doctors treating her will let their good intentions impair their scientific objectivity. They'll see only what they hope to see, and pronounce her 'cured' when she really isn't. She's already demonstrated a conscienceless insensitivity to the suffering of those who loved her. It would not be beyond her capabilities to calculatingly pretend she was 'well'—until, at a time of her convenience, she was ready to kill again."

The older woman's voice turned threatening. "However much one might wish to help her, the first priority must be to make sure Consuelo never hurts anyone else—ever again. If that means she must stay in prison for the rest of her life—or even more drastic measures—then that's what must be done!"

Peggy Sue said, "And what about Consuelo herself? How does she justify what she did?"

Another video clip. Consuelo recognized the interview room in the prison. She saw herself sitting defiantly in a chair, sneering at someone offscreen. A voice—Dr. Young's—asked her, "Why did you kill Jason and his wife?"

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The woman in the chair took a long drag on a cigarette. "That son of a bitch *used* me. I did everything I could to make him love me. And what did he do? He dumps me for a 'nice, respectable girl.' 'Somebody I can marry,' he said."

She sneered. "A slut who was spreading her legs for him when I couldn't, because I was having and taking care of his goddamned kids!"

"But why did you kill the children?"

The woman's face softened. "Well, what kind of life would they have had? No father. A mother in prison, or maybe dead in the gas chamber. They'd never be able to escape that shame—abandoned by their own parents. How could they possibly grow up happy? It was better that way. Quick, just a moment of pain and suffering, and not a lifetime."

Her eyes hardened. "Besides, those two little bastards were half *him*, too."

The picture froze on that hate-filled look, then shrank into a corner of the screen, directly over Peggy Sue's left shoulder. The latter said, "Soon, if the doctors who claim they can brainwash her have their way, Consuelo Lopez will be back on the street. Perhaps she'll come to live in your neighborhood!"

Consuelo jumped slightly, startled. This time she thought she heard a noise from the kitchen. But, listening carefully, all she heard was more babble from the TV.

"The question is, who *is* Consuelo Lopez? An innocent victim of fate, as one so-called 'expert' thinks?" The picture in the corner changed to that of Anna, then quickly dissolved to that of the gray-haired woman. "Or, as a more qualified authority believes, will she always be nothing more than a ruthless, cunning criminal?"

Peggy Sue looked directly at the camera. "Audience, *you* decide!"

Then, beaming with self-satisfaction, she continued, "But you know what the ironic thing is, Todd?"

"No, what is it, Peggy Sue?"

The insert of the gray-haired woman expanded to fill the entire screen. "The ironic thing is, Dr. Aguilar is—"

The recording ended. The only sound in the house was the oratorio on the radio, playing faintly in the background. The prayerful words intoned by the chorus, accompanied mournfully by the orchestra, reminded Consuelo of the otherworldly atmosphere of a cathedral.

There it was again! A shuffling noise in the kitchen. It couldn't be her imagination! Fearfully, not knowing what to expect, Consuelo walked into the kitchen—and stopped, paralyzed with shock.

The gray-haired woman stood by the stove, tall and erect. Her dark eyes bore deeply and unwaveringly into Consuelo. Without saying a word, the very cast of the woman's face accused and condemned her.

Consuelo stammered, "What do you want? Why are you here?"

The older woman glared at her with disgust. The corners of her lips curled, silently telling Consuelo that those were very foolish questions.

Consuelo pleaded, "I know I did all those terrible things! But I swear, I

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don't *remember* doing them! All those years, from just before Papa died to six months ago, are a blank! I don't remember *being* that evil person! I hate her and everything she did, too! Those beautiful children! How could anyone—how could I have done that to them!"

Consuelo's eyes misted over. "How can I make up for what I did? I'd give up my own life if it would bring them back! How can I convince you how sorry I am? Tell me, how!" Wiping bitter tears from her cheeks, Consuelo sobbed, "I'm sorry, I'm so sorry!"

The other woman raised her arm. Consuelo cringed at the accusing index finger pointing at her. Finally the finger drifted down, pointing at the kitchen table. Then the gray-haired woman spoke two words.

"Prove it."

Consuelo stared uncomprehendingly at the objects on the table—and then suddenly, it was clear to her what two choices the gray-haired woman was offering her. The brown plastic medicine bottle. Or—the gun.

It was a .357 Magnum, just like the one Papa taught her to shoot when she was in college. Consuelo looked wide-eyed at the older woman. It was as if she could hear her accuser's thoughts.

As long as you live, I will never let you forget what you've done. As long as I live, I will never let you rest. There can be no forgiveness for you. The blood you've spilled cries out to me, and I will avenge it. The hell you burn in for all eternity will be no worse than the one I will create for you while you still breathe.

A mini-movie flashed through Consuelo's mind. She saw herself picking up the gun. Pumping bullet after bullet into the jerking, bleeding body of her gray-haired tormentor!

Then the image dissolved—destroyed by a feeling of utter self-revulsion. *What kind of person am I? Am I capable of* that *crime, too?*

No, there was only one choice she could make. Of all the people on Earth, the gray-haired woman standing there had the best right to judge her, to decide how responsible she was for her sins—and condemn her to death.

Consuelo read the label of the plastic medicine bottle. "Depresade, 25 mg, QTY 50." It was filled to the top with green-and-black capsules. Whatever else they'd erased from her mind, she still remembered those pharmacology lectures in medical school. Fifty capsules would be more than enough.

Consuelo picked up the bottle, went to the kitchen sink, and filled a glass with water. The first capsule tasted bitter. But after a few more, they began to taste almost sweet. Soon it became an unwavering rhythm of two capsules in her mouth, a sip of water to help swallow them, then repeating the cycle.

Clutching the now empty medicine bottle in her hand, Consuelo walked her last steps, back into the family room. As she passed her, from the corner of her eye she saw the face of the gray-haired woman one last time.

It was smiling.

Consuelo lay down on her back on the couch, and waited. Her blurring gaze alighted on a small knickknack

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sitting on a nearby shelf. The porcelain figurine of the smiling little boy who seemed about the age her son would have been now, if he had lived. She tried desperately to remember holding her little baby boy to her breast, perhaps singing him a lullaby.

She couldn't. Dr. Young and the others had done their work too well. They'd tried to help her, by destroying all those bad memories from her past. But, even if there were fewer of them, they'd destroyed the good ones too.

No matter. She was a murderer. A suicide. Doubly damned. Soon she would have all eternity in hell to remember everything. She imagined Satan laughing at her, telling her he didn't believe in "neuropsychiatric defects." *She* had sinned, *she* was responsible for what she'd done. No one, nothing else was to blame except her.

The clock on the mantle chimed three o'clock. Consuelo felt herself becoming more drowsy. Closing her eyes, she folded her arms on her chest. The medicine bottle in her hand slipped through her fingers and fell to the floor.

From a greater and greater distance she heard the sacred music in the background fade away. Then, with a final soft melody full of prayerful resignation, it was gone. . . .

The fortune of the days gone by was true good fortune—but today groans and destruction and death and shame—of all ills can be named not one is missing.

—Sophocles

* * *

Anna drove recklessly toward the hospital, fighting traffic and an overwhelming sense of guilt for abandoning Consuelo. The ER physician who'd called her at the office said the drug screens were still pending. But when they'd lavaged Consuelo's stomach they recovered an ominously large number of Depresade capsule fragments.

At the hospital Anna ignored the sharp pains in her back and ran to the MICU. After identifying herself to the nurses she walked into Consuelo's room—and froze, horrified at what she saw.

Consuelo lay quiet and unmoving on a bed in the darkened room. Nasal prongs delivered oxygen to her, and a bag of normal saline dripped into a vein. Her body was attached by black cables to monitors that beeped rhythmically and flashed blood-red numbers on their displays.

A part of Anna's mind felt intense relief that all the readings on the monitors were perfectly normal. What horrified her was that, beside Consuelo's bed, sat a gray-haired woman.

Anna hissed, "*You!* What are *you* doing here?"

Then the obvious answer came to her. "What did you do to her? Are you responsible for this?"

The gray-haired woman frowned pensively. "Yes, I am responsible. If it weren't for me, if it weren't for foolish decisions I made, none of this would have happened. Those two beautiful children would never have died."

"Did *you* make her take those capsules?"

"No. It was her own choice." A

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strange smile flickered on the woman's face. "*Her* choice."

Anna said furiously, "What kind of person are you? How could *you*, of all people, do those vicious things to her?"

"I *had* to test her like that. It was the only way to prove she was really cured, and no longer a danger to anyone else. If your treatment hadn't really worked—if she was pretending to be cured, or if it was only partially successful—she would have tried to kill me with the gun I gave her. After my little performance at the parole board meeting, and the other things I had to do to make her and everyone else think I hated her, she could've plausibly claimed I threatened her with it. That she killed me in self-defense. And wouldn't *you* have believed her?"

The gray-haired woman saw the horrified look on Anna's face. "I'm sorry. You didn't know about the 'gun' part of my experiment." She rattled her heavy purse, and shrugged. "No matter. The important thing is, Consuelo passed my test. Instead of lashing out at me, she showed by what she did that now she could feel guilt and remorse. Faced again with 'abandonment,' she turned her pain and loneliness inward, against herself, and not against me. She made the *right* choice."

Anna's face burned with rage. "You call *killing* herself the right choice? If you were trying to execute her, you were too late! The woman who murdered those people is already dead! I, Nemo and the others—*we* killed her! When we repaired the parts of her brain that made her turn violent when she felt abandoned—when we wiped out her memories of *being* that pathological personality—that 'Consuelo' died! She paid with her 'life' for her crimes! Then, *this* Consuelo was born."

Anna pointed at the young woman on the bed. "In every meaningful way, she's a new person now. It's not fair to blame and punish her for what that other Consuelo did. *This* woman is *innocent!*"

"And now, after what I've seen her *do*, I agree." The gray-haired woman paused. "But don't be so naive. I would never deliberately hurt Consuelo. Actually, I'm thankful you've misjudged me. I was afraid you would figure out my plan, and prevent me from doing it in a well-meaning but misguided attempt to protect her."

Reading the bewilderment on Anna's face, she continued, "Nearly all the capsules in the medicine bottle I gave Consuelo were placebo. Only the top three were Depresade. Just enough to make her sleep soundly. The gun I offered her didn't have any bullets—just in case she decided to turn it on herself instead of me. And who do you think called the paramedics to bring her here?"

Looking down at the slumbering figure on the bed, the gray-haired woman said, "When Consuelo wakes up, she and I will have a long talk together. Then I'll call Krueger and tell him to get the parole board to have her transferred from your custody to mine. We can't undo what's already happened. But we can help each other rebuild our lives. It's not too late for that."

Then the older woman looked at Anna. "I can't tell you how grateful I

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am to you and the others for what you've done for Consuelo. It's like a miracle. She was 'dead and has come to life,' she was 'lost and has been found.' After everything that's happened over the past nine years, I'd nearly lost faith that life had any meaning, or in God. As much as my heart wanted it to be so, I didn't dare even hope that the treatment had worked. Even though it tore me apart inside to do those terrible things to her, I had to be sure Consuelo was cured, beyond any possible doubt. For her sake, for the sake of those she might have hurt if she hadn't really been cured—and for my own.

"Thank you, Anna. You were the only one who was kind to Consuelo when everyone else was cruel. You've been more than just a doctor caring for a patient. When she desperately needed one, you were her friend. But now she needs more than kindness, or even friendship."

Consuelo Lopez stirred a little, almost ready to awake, reborn, to a new life. Then, like a mask falling from her face, the gray-haired woman's stern expression changed completely. Anna had never seen one like it before. It was full of pain and anguish, yet also held the most profound joy and happiness.

Her eyes brimming with tears, Dr. Maria Teresa Aguilar Lopez tenderly caressed the hand of her only child, her beloved daughter, and sobbed, "Now she needs someone who loves her."

Love never ends. . . . And now faith, hope and love abide, these three; and the greatest of these is love.
—St. Paul ■

We welcome your letters, which should be sent to *Analog*, 1270 Avenue of the Americas, New York, NY 10020. (CompuServe: 71154,662. Internet: 71154.662@compuserve.com.) Space and time make it impossible to print or answer all letters, but please include your mailing address even if you use e-mail. If you don't want your address printed, put it only in the heading of your letter; if you do want it printed, please put your address under your signature. We reserve the right to shorten and copy-edit letters. The e-mail address is for editorial correspondence *only*—please direct all subscription inquiries to: P. O. Box 54625, Boulder, Co 80322-4625.

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THE REFERENCE LIBRARY Tom Easton

The Family Tree, Sheri S. Tepper, Avon, $23, 377 pp. (ISBN: 0-380-97478-9).
Illegal Alien, Robert J. Sawyer, Ace, $? (hc), 234 pp. (ISBN: . . .).
Slant, Greg Bear, TOR, $24.95, 350 pp. (ISBN: 0-312-85517-6).
War of the Gods, Poul Anderson, TOR, $22.95, 304 pp. (ISBN: 0-312-86315-2).
Beyond the Beyond, Lee Goldberg, St. Martin's, $23.95, 292 pp. (ISBN: 0-312-15064-4).
Putting Up Roots, Charles Sheffield, TOR, $21.95, 255 pp. (ISBN: 0-312-86241-5).
Saint Vitus Dances Eternity: A Sarajevo Ghost Story, Stewart Von Allmen, Borealis/White Wolf, $21.99, 71 pp. (ISBN: 1-56504-947-0).

Sheri S. Tepper is a marvelously inventive writer who deserves to sit on the bestseller lists beside any other writer you care to name, in or out of science fiction. Therefore, you must be so delighted to hear that she has a new novel out that you will rush right out, buy it, and be lost to this column and this magazine until you have finished reading it. To fulfill my columnar duty, I should therefore review half a dozen or so books before spilling the necessary beans. But since that would not be kind, I will tell you immediately that to the same shelf that already holds *Grass* (1990), *Raising the Stones* (1991), and *Shadow's End* (1995), among others, you may now add **The Family Tree**.

Wait! Don't go! I'm not done!

Oh, well. A few of you are left. For you, I will say that this tale begins when Dora Henry finds a weed. Dora is a cop married to a strange fellow, Jared, who as a youth was stricken by lightning and briefly ran off with the mysteriously enticing maiden Corey. Jared wants nothing more from Dora than cooking, housekeeping, and order while he busies himself in a basement workshop she does not visit. She knows that Jared will have a cow when he sees the weedy intrusion upon the order he loves, but she leaves the plant alone. She even talks to it a bit, and she is charmed when it seems to respond, leaning its leaflets toward her.

In due time, Jared has the predicted cow, tries to poison the weed, and discovers that it has a bite that lands him in the hospital. Dora moves out, is surprised to find the weed popping up by her new doorstep, and is soon investigating the murder of a genetic engineer who may or may not have produced animals able to talk.

Meanwhile, in a world far, far away, the storyteller Opalears is plucked from the harem to accompany the sultan's son on a quest to the wizards of the Hospice at St. Weel with the fate of the world at stake. In Dora's world, trees are springing up all over, taking over the suburbs, pushing people to-

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ward the city but leaving highways and farms alone, responding quite appropriately when Dora asks one to mind her bike, dropping fruit in her hand, and so on. Opalears's quest gains a sidekick when Prince Izakar of Palmia joins up, and the reader begins to get some inkling of what is going on, for Izzy has had the educational benefits of an ancient library hidden in the bowels of his palace and he knows that in an earlier cycle his world was dominated by tribes of Zhapanees and Stralians and Mericans (etc.), instead of pheledics and ersuniels and ponjics (etc.). There is mention of a widespread religion based on the worship of Korè (whom the reader may recognize as the maiden-mother-hag goddess of ancient lore).

Tepper's having fun as she works—another religion worships the fish Ghoti (gh as in cough . . .)—and she is obviously dealing with fantasy. One can enjoy the tale as fantasy, but many might have serious problems with it on that level, hanging up on the "Wait a minute!" response. Let me assure such people that Tepper is as usual offering a great deal more than just story: she is making serious points about our mistreatment of the world, saying that there are other ways of interacting with it, and that it could rise up and assert itself, not to punish us but to rebuke us, to guide us in more benign directions (those trees). If we refuse to mend our ways, perhaps we should be replaced, perhaps even by our own creations, who might, because they are closer to their roots, be better able to coexist with a benign nature. The few surviving humans must then find a path to atonement.

Or . . . Might one of their descendants find a way to restore the human world? That would call for some sort of time travel, wouldn't it? It might even result in events that would draw a police officer's attention and embroil her in an astonishing adventure.

I really shouldn't say much more, other than that this one could easily come with a money-back guarantee. Very few of you would want to cash that in.

Now you're ready to leave me? Sorry. You might as well stay put. Those who bolted after my first paragraph have surely stripped the bookstore shelves bare by now, and there won't be another shipment in till next week. (You can always order on-line from Amazon Books at http://www.amazon.com.)

The O.J. Simpson trial seemed to last forever on TV and in the tabloids, so I suppose it's not surprising that it should show up in SF. It's been transmuted, of course—the murderer is not an ex-sports star, and the victim is not his ex-wife—but O.J.'s case gets mentioned a number of times.

Who *is* the murderer? Who *is* the victim? For the details, see Robert J. Sawyer's latest, Illegal Alien. It opens with a Russian sub, an American aircraft carrier, and a Brazilian cruise ship racing for an alien spacecraft that has just splash-landed in the Atlantic. The sub gets there first, but the ship lifts itself out of the water to the carrier's deck, where scientist Cletus Calhoun (whose TV popularizations seem modeled on Carl Sagan's) and

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presidential science advisor Francis Nobilio are waiting, and disgorges a single very alien fellow. Soon he and his crewmates are at the UN, making benign-sounding speeches and asking for help in repairing damage to their ship. Not long after that, they are quartered in a college dorm, under guard, studying and being studied.

And who's this on the floor? Eviscerated, organs scattered, head and thigh severed, eyeball and neck, jawbone and appendix missing. Why, it's Cletus Calhoun, and there's a drop of alien blood right there! Most of the aliens were at a lecture at the time of the murder, but one has just molted—perfect way to clean off blood—and no one else had the opportunity. Furthermore, the suspect has in the recent past had to process a dead colleague, which involves evisceration and removal of organs to be stored for future use as spare parts. Hence the arrest, pit bull prosecution team, famous black lawyer signing on for the defense, and so on.

There's never really much doubt about whether the perp is guilty as charged. The story lies in uncovering an explanation that owes more than a little to Charles Pellegrino's ruminations about interstellar paranoia, exacerbated by a peculiar life cycle. And it all makes sense in the telling.

Since Sawyer is a frequent resident of these pages, I don't really need to say he's good. You already know that. But I can assure you that he hasn't slipped. You'll enjoy this one.

Greg Bear's *Queen of Angels* appeared in 1990 with visions of a world split along new lines. Those who got the decent jobs were the "therapied," whose mental kinks had been ironed out with the aid of nanotechnological implants. The "untherapied" were the underclass. Yet the old divisions remained as well, and that story played with crime and madness, politics and fanaticism, to good effect.

If you remember *Queen* fondly, you'll be delighted to hear that Bear now has another offering set in the same world and featuring several of the same characters—Jill, the supercomputer who then was monitoring the Centaurus space probe; Martin Burke, who had developed the use of nanotechnology to explore the inner workings of the mind to his own downfall; Mary Choy, Los Angeles public defender with a nanotech-modified hide. In **Slant**, Jill is now a true artificial intelligence who is talking on the sly to a mysterious other, Roddy, who presents himself as a youth whose feet are immersed in earth. Burke is a therapist who has just been invited to consult on a sudden upswing in nanotherapy failures. Choy is a new hire for the Seattle PD, looking at a sudden upswing in social unrest.

We learn that society has a faction of naturals and "High Naturals" who do not need nano-therapy and tend to sneer at the rest. Now meet Alice, an actress well known for sexually explicit roles, her career slipping a bit, her agent calling to say a certain wealthy fan would pay high for a personal visit (and performance, natch). Unfortunately, the fan is distinctly weird, and as soon as Alice leaves, he kills him-

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self. Alice, meet Mary, and again when a youth whose feet are immersed in dirt appears in virtual reality at a party and tries to kill the actress.

Meet Jonathon, a wage slave familiar with nanotech. He is being invited to join a secret society of high naturals, the Aristos, who are expecting a collapse of the therapied order. They plan to survive, but they're secretive about details. All Jonathon learns at first is that the guest speaker at a meeting seems to believe that the world's collectivity of bacteria comprise a vast and powerful mind.

Green Idaho, all but seceded from the USA and populated by rugged-individualist, gun-happy, survivalist, anti-modern yahoos, is home to Omphalos, supposedly a high-tech crypt where the rich can wait for future revival. Jack Giffey is leading a raid to liberate some of the wealth he thinks the rich have stashed beside their freezers; he has some stupendous weaponry at his disposal.

Clues lead Jill's human operators to recall a one-time coworker, Seefa Schnee, with strange notions about using evolution to turn bacteria into a computer. Roddy's conversations with Jill turn into an outright hack. The Aristos turn out to be behind Omphalos. And . . .

Well *of course* everything turns out to be connected. One can even see the connections coming fairly early on. Getting there takes awhile, however, for Bear wants to show you the life of his imagined future in some detail. He pays less attention to making his characters appealing, though, and I found it difficult to absorb myself into the story until the action began to pick up toward the end. I also found the title distracting—it is presented variously as *Slant, / Slant,* and / (it apparently refers to the interface between people in couples, as in M/F, M/M, F/F)—and most of the synthetic quotations used as section epigraphs pretentious.

Still, Bear's imagination is always richly intriguing, and in the end I felt satisfied.

Poul Anderson likes his Vikings. Heritage is part of it, to be sure, for his parents were Scandinavian and he has dwelt in both Minnesota, a land of many Scandinavian immigrants as well as sky-blue waters, and Denmark. There's love as well, for he has long studied the region's languages and literature and he has borrowed spirit and theme for many of his SF novels. And every once in awhile, he has worked quite explicitly with the literature, gifting us with new tellings of ancient tales such as the Icelandic *Hrolf Kraki's Saga* (1973).

And now we have **War of the Gods**. This was apparently a tougher job than *Kraki,* for the only early source—Saxo's *Gesta Danorum* (c. 1208)—is jumbled and incomplete. Anderson had to interpolate, extrapolate, and imagine to construct a unified tale of the myth of Hadding, that king of the Danes who was raised by giants, favored of Odin, and . . . Well, Anderson doesn't tell you till the Afterword that Hadding was an avatar of the Vana god Njord, but the initial setup makes it clear that something of the sort is going on. Once, Anderson tells us, there was war between Vana

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and Aesir. To end it, Odin sacrificed an eye to Mimir as the price of good advice, and traveled beyond death itself in search of answers. When he returned, he brought peace, and the Vana and Aesir exchanged hostages. To the Aesir came seagod Njord and his children, Freyr and Freyja, the gods of fertile soil and fertile love. And when in due time these three were ill-treated, Odin must find a way to stave off a new war that would bring down the gods and all.

Enter Hadding, his father killed in war, fostered by giants well away from the hunt for heirs, growing up charmed and charming, skilled in many ways, yearning for the sea, visited by a one-eyed wanderer attended by ravens, going off to war, claiming vengeance for his father and gaining the throne of the Danes. A life of adventure and pain, loyalty and betrayal, love and honor, told in a stark style that remembers older forms, and an ornament for any shelf of Anderson's works.

You just have to buy it, especially if you—like me and many others—read your fill of fairy tales, myths, and legendry before you discovered SF. This is fantasy close to its roots, and close to your own as well.

When Lee Goldberg isn't writing books such as **Beyond the Beyond**, he's a television writer and producer (*Seaquest, Spenser: For Hire, Baywatch,* etc.). You might therefore expect him to know something about hooking and holding an audience, pacing, action, and more. He also knows the industry, and he's well aware of the role *Star Trek* fandom played in maintaining interest in that classic series until the time to revive it finally lurched around. Perhaps not surprisingly, his view of industry and fandom is a bit jaundiced, but he's still able to have a good deal of fun with it all.

To begin, he replaces *Star Trek* with a very recognizable *Beyond the Beyond*. The differences are cosmetic—not Spock, but Snork; not pointy ears, but an elephantine proboscis. The similarities are pathetic—BB-brained fans who attend BB cons in cheap imitation uniforms, wear Snork noses, and buy memorabilia at inflated prices; aging stars so hung up on their old roles that they never take their uniforms off and have rebuilt their living rooms as the bridge of the Confederation starship *Endeavor*; aging stars and writers who now make their living off the con circuit.

And here comes the studio, ready to do a remake with all new stars and writers. The fans are furious. Aliens have taken over! The Confederation must be defended! Break out the tasers! Take no prisoners! Get laid!

Add in superagent Clive Odett, head of The Company, a talent agency with marked resemblances to The Mafia, and you have the potential for mayhem. Indeed. And here is Charlie Willis, one-time star and ex-cop now fallen to studio security, star protector, smack dab in the middle of the growing pile of bodies. Not to mention his lady-love, Alison Sweeney, studio trouble-shooter.

Face it, sometimes the best way to deal with trouble is to shoot it. Or drive it off the top of a parking garage, blow it up, feed it toadstools, smother it with

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hooters . . . Goldberg uses just about everything he can think of to send up the studio system, fandom, *Star Trek*, Trekkies, agents, actors . . . You name it, he'll make you laugh about it.

Have fun.

Every so often, Charles Sheffield puts in a stint at keeping the Heinlein juvenile alive and well. His latest—third in the Jupiter series that began with *Higher Education* (1995) and *The Billion-Dollar Boy* (1997)—is **Putting Up Roots**, which begins as teenager Josh Kerrigan comes home to find a note from his mother saying, in effect, " 'Bye. You're on your own now, and here's a ticket to Uncle Ryan's farm."

The ticket's outdated, but Josh has just enough cash in his pocket for the bus. Unfortunately, there's a new aunt at Uncle Ryan's, and she's a classic wicked stepmother. Soon Ryan and his autistic cousin, Dawn, are on their way to distant Solferino, there to labor for the giant conglomerate, Foodlines. Alas, when they arrive they spot a strange ship belonging to the mining conglomerate, Unimine; the base is untenanted, and a fast-talking smoothy hustles them off to the boonies. When they return, the base's databases have been wiped.

As soon as you spot Dawn's talent for befriending wildlife and hear the rumors that at least one of Solferino's species is relatively intelligent, you'll have all you need to guess the rest of the story. There is a plot afoot! Evil corporations are scheming to rape a world in that fine old colonial tradition, natives be damned, and it is up to Josh, Dawn, the other indentured kids, and the inevitable secret agent to save the day.

They do it, of course, and any kid reading the story will feel very satisfied at the end.

The atrocities of Bosnians and Serbs have not been much in the news lately, but if you have friends, as I do, who are in the National Guard, you know that Bosnia is still there and that we have people standing watch in hope of preventing a revival of ancient passions while the locals struggle to put lives, a vibrant multiethnic culture, and a nation together again.

The task that faces those locals is as enormous as the one that faced Europe and Japan after World War II, but no one is offering the Bosnians much of a Marshall Plan. They have a "Bootstrap Plan" instead, rebuilding largely on their own, relying on small donations and volunteerism and sheer spirit. It's working, slowly, but those ancient passions remain and everything could go up in flames again.

If you wish to help, you could send checks to any of a number of worthy foundations. Or you could buy a copy of Stewart Von Allmen's **Saint Vitus Dances Eternity: A Sarajevo Ghost Story**, all profits from which go to the New Bosnia Fund (donate via Mosaica: The Center for Nonprofit Development and Pluralism, 1000 16th Street, NW, Suite 604, Washington, DC 20036; 202-887-0620). *Vitus* is a 15,000-word story presented in side-by-side English and Bosnian (Serbo-Croatian), with an ample assortment of starkly evocative block prints and an afterword by Michael Moorcock,

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who in the 1960s predicted that the Balkans would erupt when the Soviet Empire finally fell. It's a coffee-table book. It's a tract.

And if the fiction—in Sarajevo, the long-dead compete for the newly dead, struggling to exploit them in various ways; the narrator, who in life was a doctor, informs the readers of the area's long and bitter history, ancient passions, modern hypocrisies; the end is a hint of hope among the ruins—is too starkly stylized to have much hope of commercial success, it serves the purpose of the tract very well, reminding us all of how thin is the veil between us, with our comfy American existence, and the utter, chaotic hell of a Sarajevo surrounded by Serbs.

Reminding us as well that we, too, have politicians (and others) who can think of nothing better to do with their lives than to tear at the veil. ■

IN TIMES TO COME

Our February issue features three wildly different novelettes. "Olympus Mons!" is another of Bud Sparhawk's exotic sports stories, this time a bicycle race (I use the term somewhat loosely) down the slopes of . . . well, the title says it all. Paul Levinson's "The Orchard" is a quiet, thoughtful piece; are you sure that the artifacts of an intelligent civilization would be easy to recognize? And "Roll Over Vivaldi" is Stephen L. Burns in, shall we say, one of his less dignified moods. . . .

H. G. Stratmann, perhaps best known to *Analog* readers for his fiction, is also a cardiologist. Next month he offers his first *Analog* fact article, a doctor's view of "Sex in Space: The Fantasy and the Reality." And we'll have short stories by authors including Poul Anderson and Jerry Oltion to round out a varied and enjoyable issue.

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BRASS TACKS

Dr. Schmidt,

I just got the June *Analog*, and I am afraid that Mr. Kooistra's article ("Paradigm Shifty Things")is a sad example of too little understanding chasing some rather dubious facts.

The most glaring case is the treatment of relativity, which can be charitably described as under-researched. Mr. Kooistra asserts, "Unless you can point to experimental data that demonstrates that gravity is mediated by light-speed-limited gravi-whatsits (why the hyphens? and why not just say gravitons?) I don't much care what you say." Well, I seem to recall the first confirmation of relativity was the correct prediction of regression of the orbital nodes of Mercury, an effect unpredicted by classical gravitational theory and unexplained by "no delay" action at a distance, but correctly described by Einstein and a light-speed delay in gravity. This can easily be verified by any standard text on relativity, and is literally a textbook example of a mystery solved by a new physical theory. Such nodal regression has also been observed and reported on in closely orbiting double stars, again confirming general relativity and delay in gravitational transmission.

The proposed gravity wave observatory, if it succeeds in sorting out the gravity wave signal from the seismic noise, will be another experimental confirmation of transmission delay of gravity. Indeed, if gravity is instantaneous action at a distance, it is not at all clear how it can produce waves. Doesn't any sort of wave require some propagation delay?

Mr. Kooistra also falls prey to another error in his treatment of frames of reference. Since apart from its orbital motion the Earth moves in essentially the same trajectory as the Sun in galactic orbit, there is no aberration of sunlight as seen from the Earth, excepting a tiny amount from gravitational deflection of the planets, which is likely too small to measure. The frame of motion of both bodies is essentially the same with respect to the background of the stars. He also fails to address this in his other discussions of planetary orbits. He asserts, "The curvature of space due to the Sun is . . . moving with the Sun . . . the Sun is going to have to tell that bit of curved space where Pluto is going to be in five hours . . ." Sorry, but this confuses two frames of reference, the frame in which Pluto and the sun are stationary with respect to each other except for mutual orbital motion, and the "absolute" frame in which the sun, spacial distortion and Pluto are moving as a group with respect to the distant stars. An observer who happened to be stationary with respect to the stars would see a time vary-

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ing gravitional distortion of space as the Solar System passed. And observers would see an increasing delay in this spacial distortion as their distance increased from the Sun's path. In other words, they would see a gravity wave of an extremely long period, just as an observer would see an electromagnetic wave if a charged body were to follow the same trajectory.

In like manner, a sudden collapse of the sun would produce one as well (no pun intended). This sort of collapse event is precisely the effect created by a supernova collapse, and is what the researchers hope to detect with the gravity wave observatory among other phenomena.

I find Mr. Kooistra's insistence on experimental data somewhat amusing since he doesn't supply any of his own, just assertions and some very dubious quotes from the literature. His discussion of Laplace is especially funny, since it contains the same reference frame error he makes in his other discussions, although he has a better excuse—Laplace assumed an "absolute" reference frame himself and this led to the same problems. They vanish along with the absolute frame in modern relatvity.

Now for the nasty part—how could you let such elementary blunders slip by you? The regression of the orbit of Mercury is so well known that you must have been aware of it. Your doctorate is in physics—have you forgotten the abandonment of absolute reference frames—the very foundation of relativity? Apart from the polemic style of the piece, it is just not very well researched. Surely there must be other writers who understand enough of what they criticize to contribute to *Analog*. There are genuine paradoxes in cosmology today—the apparent age of the Universe as younger than the apparent age of brown dwarfs is one, so why not some well-researched articles on that? Or why not one on the effort(s) to detect gravity waves?

I have no problem with criticism of mainstream science, but I insist upon an understanding of it by the critic. I am afraid that Mr. Kooistra's article is short of the mark.

R. BOHL

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The author, and Dr. Van Flandern, reply . . .

Since the ideas about the speed of gravity I presented are not mine but those of Dr. Tom Van Flandern, I asked him to reply to the technical point of the Mr. Bohl's letter:

[TVF responds] (With respect to Mercury) reader Bohl is referring to the precession of the perihelion (not the nodes) of Mercury's orbit, an effect explained (but not predicted) by General Relativity (GR). The excess advance of Mercury's perihelion was already well known even to Neptune's discoverer, LeVerrier, in the mid-19th century, who thought it might be caused by a hypothetical inter-Mercurial planet he called "Vulcan."

The size of the excess advance of Mercury's perihelion (in radians per revolution) is given by the GR formula: 6 pi G M/ [a $(1\text{-}e^2)$ c^2], where G is the gravitational constant, H is the mass of the Sun, a is the mean distance from Sun to Mercury, e is the eccentricity of Mercury's orbit, and c is the speed of light. This formula is independent of the speed of propagation of gravity. Reader Bohl apparently noticed the factor c^2 in the de-

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nominator of the formula, and assumed that it represented the speed of gravity. This is a common confusion.

The factor $1/c^2$ in this formula arises from the permittivity of spacetime in the theory of relativity. According to GR, the term effectively measures the stiffness of space-time's resistance to curvature. Terms of this type always contain c^2 rather than c by itself, and would be the same for any propagation speed of gravity. Propagation delay terms, by contrast, contain the factor $1/v_g$ to the first power, where v_g is the propagation speed of gravity. GR contains no such terms. A simple, classical interpretation of this absence is that the propagation speed of gravity is unmeasurably large ($v_g >> c$).

Mr. Bohl says the proposed gravity wave observatory will provide "another experimental confirmation of transmission delay of gravity." This is another common confusion fostered by some relativists who do not like to be questioned about the implications of the instantaneous nature of gravitational interactions. Relativists point out that gravitational waves, if they exist, must propagate at speed c, and leave the student to draw the false conclusion that something has just been said about the speed of gravity. That is not the case.

In electromagnetism, electric and magnetic forces are carried by "virtual particles" at effectively infinite speeds. At least, no propagation delay has ever been detected for these forces. Disturbances in the space-time medium brought about by the action of such forces are light-waves, which propagate at speed c. Paralleling this, the force of gravity is carried also by "virtual particles" at effectively infinite speeds. And disturbances in the space-time medium brought about by gravitational forces, called "gravitational waves," must propagate at the only speed any wave can travel through space-time: the speed of light, c.

Let's draw an analogy. The speed of waves through air is the speed of sound, whose value depends on the physical properties of air such as density. Suppose an asteroid impacts the Earth. The asteroid impact delivers a force to the Earth, analogous to electromagnetic or gravitational forces. The asteroid's speed of propagation through space before impact might have been anything. But after the impact, the shock waves set off in the air must travel away at the speed of sound regardless of the incoming speed of the asteroid. These shock waves are analogous to light waves or gravitational waves.

By careful application of this analogy, we can see that the propagation of gravitational waves at the speed of light tells us nothing about the speed of propagation of gravitational forces.

Mr. Bohl also says: ". . . there is no aberration of sunlight as seen from the Earth . . ." He may wish to check his astronomy text again, where he will be reminded that the apparent Sun is 20 arc seconds west of the true, instantaneous Sun due to aberration. This 20 arc seconds, an astronomically large angle, is likewise the angle through which the Sun appears to move relative to the background stars in the 8.3 minutes it takes sunlight to travel from the Sun to the Earth.

The remainder of Bohl's letter draws out additional examples of these same confusions. The fault is not Bohl's alone. The teaching of relativity is frequently

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confused on these very same matters. *Analog* readers are invited to check out the fuller discussion of the speed of gravity issue during April and May of 1997 in the sci.physics newsgroup on the Internet. Many sites archive such discussions.

TOM VAN FLANDERN

As for my own $.02 worth, let me just say that Stan didn't let any elementary errors slip by—he simply understood what was being said and argued more fully than Mr. Bohl did. It is unfortunate that Mr. Bohl's letter is more noteworthy for its high ratio of vitriol to understanding than for the points he tried to make, but it is not at all uncommon to recieve letters like this when you competently challenge the conventional view. I'm very happy to point out, however, that mail I received concerning the article has been overwhelmingly positive, proving to me once again that *Analog* readers are a special group indeed.

JEFFERY D. KOOISTRA

Dear Stan:

I enjoyed your editorial, "New Attitudes For New Frontiers," in the June issue. However, I feel compelled to comment on a couple of points.

First let me say that I've worked on two Indian reservations, and have two Navajo friends, and another who is part Cherokee. The Indians, or Amerinds, did believe in land ownership, but only in the concrete sense of "all the land on this side of the river is Cherokee land." They didn't comprehend artificial property lines and surveying because those were abstract. Nowadays, our cultural attitudes often gloss over the differences between the abstract and the concrete.

Interestingly, the word "Navajo" is a corruption of the Tewa word which means "they took our land." If they didn't believe in land ownership, why did the Tewa complain of its loss? I asked one of my Navajo (Dine) friends if he knew much about the Tewa, and he said, "Nope. Never heard of 'em." So apparently the Navajo and the Tewa did not end up living together in happy harmony.

Of course, it's also worth noting that to speak of Amerinds and their worldviews collectively is as bad as speaking of Italians as holders of the European world-view. Perhaps some tribe somewhere in North America didn't care if they caught members of another tribe on their hunting grounds on their side of the river. I just don't know of any that were that broad-minded.

How predictably silly that some illogical individuals will argue How We Might Mistreat Native Peoples to stop us from space exploration. My Cherokee friend is an ex-NASA employee, and can't wait for some private company to take the initiative to get us to Mars!

FRAN VAN CLEAVE

Phoenix, AZ

Dear *Analog*,

From a letter in the June issue, I see you would like our response to the new right-hand footers of the stories. Well, I am most grateful, for now I don't have to turn back to the start of the story to check its author when something he/she has written particularly catches my attention. The title means nothing to me *while* reading because I get really involved in most stories, the title being

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only a convenience before and after.

I suggest the unhappy reader should use a bookmark, even a Post-it tab, to find his place. It would save his having to flip through the whole *Analog*.

Of course, the ideal would be to do as *Asimov's* did, when I could afford to take it as well as *Analog*: the title was on the left and the author on the right.

I, too, am a major fan of the Schmidt editorials. They are so very much more *sensible* than the superficial stuff "the media" come up with these days. And you *reason* things out, a missing element in so much modern writing. (Oh, where is the world going to end up if we don't all *think!*)

MURIEL ENOCK
mjenock@mail.islandnet.com

Dear *Analog*,

I can only agree with J.A. Coffeen (Brass Tacks, June '97). I would much rather (if a choice has to be made) see the story title at the bottom of each page. The title has some bearing on the story itself, and I find myself referring to it quite often to see if the atmosphere it promises really gets written out in the story. If I want to check on the author—much less often—I can always refer to the title page. . . .

I might add that I find it much easier to remember a story by its title, especially at AnLab time. It's much easier to vote using the index when the title has been drummed into one's mind on every page.

Mr. Coffeen's suggestion of an alternative is interesting, but do we really need to be reminded we're reading *Analog*? Surely, the title and authors name could be made to face each other on facing pages, giving the reader the best of both worlds.

I've been subscribing to *Analog* for over 20 years, now, ever since my wedding. This is just a small quible and there's no possibility of my canceling in the foreseeable future. You've had some memorable and thought-provoking stories in these pages, which is why I love science fiction (and *Analog*) so much (though my own scientific education is scarce at best; but I do try to keep informed). I couldn't imagine my month without your input. Keep up the good work.

FRANCOIS FERLAND
fferland@cybernaute.com

The one thing our voluminous mail made clear is that there's no way to satisfy everybody—but fortunately, as you say, it's a relatively minor matter, so I hope we won't unduly offend those who would prefer something other than what we do. The title of the story seemed most important to most readers who wrote, so we're going back to that, and publishers prefer to have the name of the magazine somewhere on each pair of pages—not for long-established subscribers, who surely do know what magazine they're reading, but for new readers who might just be discovering it, and to be sure it appears on any photocopies that might be made for some legitimate reason. Several readers suggested including all of the suggested items, but that would make for a very crowded page and/or require smaller type or less text—and those, too, would surely bother some readers! ■

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(ss) One Small Spin . . . . . Sep 92
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(ss) Arnold the Conquerer . . . . . Dec 88

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(nt) Poems Are Made by Fools Like Me . . . . . Jan 108
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(sf) Paradigm Shifty Things . . . . Jun 59
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(nt) Easter Egg Hunt: A Christmas Story . . . . . Dec 40

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(fa) Biology at the Extremes . . . . Dec 64
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(sf) Learning Unbound: On-Line Education and the Mind's Academy . . . . . Mar 48
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(ss) The Space Program . . . . . Jul/Aug 74

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(ser) O Pioneer! (Part 1of 3) ... Oct 12
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(ss) Warrior's Honor ..... Apr 91
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(nt) Fire and Ice ..... May 68
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(ed) A Bad Time for Aliens? .. May 4
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(ed) Public Versus Private ..... Apr 4
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(nt) Safari ..... Jul/Aug 148
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(ss) Dream to Live By ..... Oct 83
(ss) Payoff ..... Aug 188

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(ss) Second Chance ..... Sep 101
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virtes, s.c.—
(ss) Last of the Soft Things .... Jan 34
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(fa) Relics of the Big Bang ..... Apr 56

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(ss) The Play's the Thing ..... Feb 86
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UPCOMING EVENTS Anthony Lewis

15–18 January 1998
ANACONISM '98 (Colorado area sf conference) at Sheraton Denver West Hotel and Convention Center, Guest of Honor: Joe Haldeman. Registration—$20 in advance, $35 at the door. Info: IBECC, PO Box 21766, Denver CO 80221-0766; 303-426-1847; email: anaconism@ibecc.org; URL: http://www.abwam.com/ibecc/anacon/

16–18 January 1998
CHATTACON XXIII (Chattanooga area SF conference) at Clarion River Plaza, Chattanooga, Tenn. Guests of Honor—Jack Vance and Howard Waldrop; Special Guest of Honor—Terry Bisson; Regional Artist Guest of Honor—Julia Morgan-Scott; TM—Charles L. Grant. Info: Chattacon XXIII, Box 23908, Chattanooga, TN 37422-3908. Email: chattacon_info@mindspring.com

23–25 January 1998
CONFUSION 18 (Ann Arbor area SF conference) at Van Dyke Park Suite, Warren MI. Guest of Honor—Connie Willis; Science Guest of Honor—Marvin Minsky; Artist Guest of Honor—Jane Irwin; Fan Guest of Honor—Mary Ellen Wessels; TM—Larry Tucker. Info: ConFusion, PO Box 8284, Ann Arbor MI 48107; 313-487-8743; email: confusion@stilyagi.org; URL: http://www.stilyagi.org/cons/confusion.html.

13–15 February 1998
BOSKONE 35 (New England area SF conference) at Sheraton Tara, Framingham, Mass. Guest of Honor—Walter Jon Williams; Official Artist—Omar Rayyan; Special Guest—STANLEY SCHMIDT; Featured Filker—Joe Ellis. Info: Boskone 35, PO Box 809, Framingham, MA 01701-0809; (617) 625-2311; (617) 776-3243 (FAX); email: boskone@nesfa.org URL: http://www.nesfa.org/boskone/flyer.html

5–9 August 1998
BUCCONEER (56th World Science Fiction Convention) at Baltimore Convention Center and nearby hotels, Baltimore, Md. Guests of Honor—C. J. Cherryh, Milton A. Rothman, STANLEY SCHMIDT, and Michael Whelan; TM—Charles Sheffield. Registration until 30 September 1997-$110 (80);supporting $30 (22); children +4 to +12 $55 (40), children -0.75 to +4.0 FREE (all ages as of 5 August 1998). This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Info: Bucconeer, Post Office Box 314, Annapolis Junction, MD 20701. Email: baltimore98@access.digex.netWeb page: http://www.access.digex.net/~balt98

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How to make your car invisible to radar and laser...*legally!*

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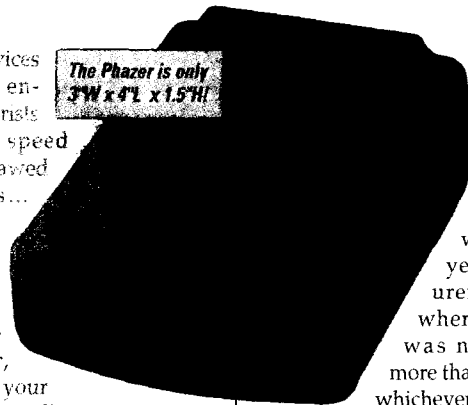

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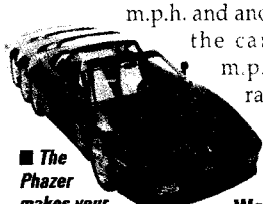

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